RUSTY

Jim McDivitt
APOLLO 9 CDR
Flown on APOLLO 9

LMP
APOLLO 9

APOLLO 9

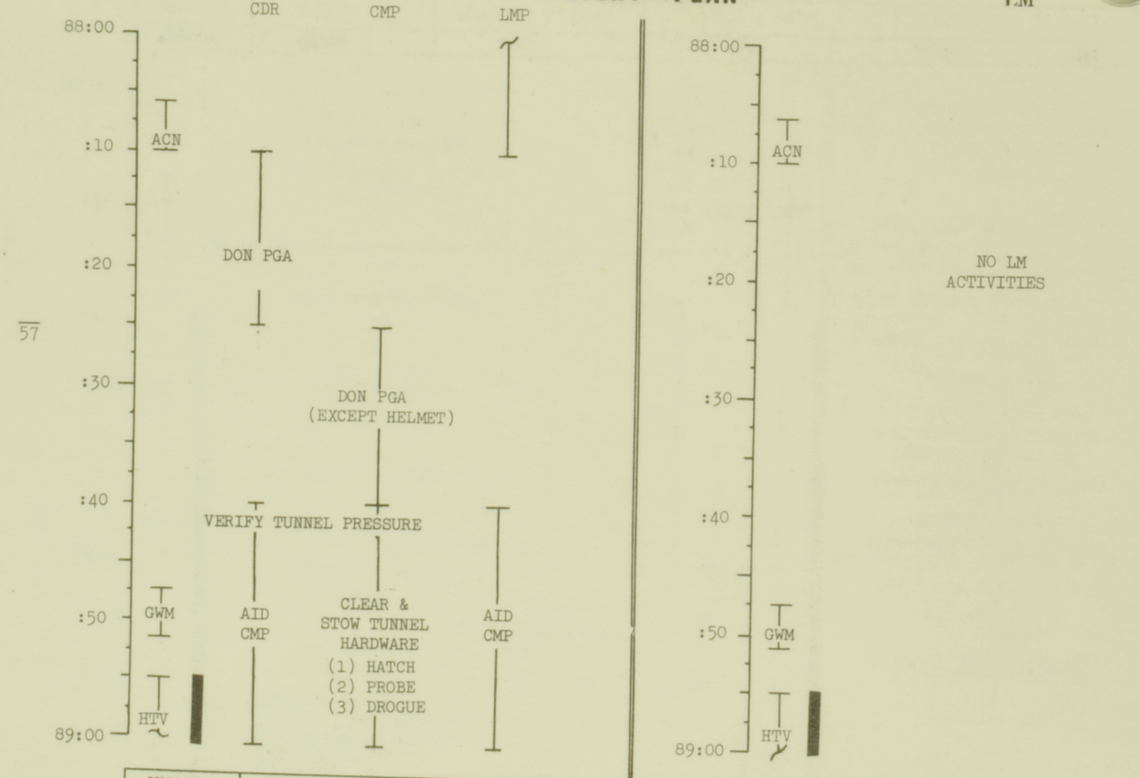
LM
RENDEZVOUS ACTIVATION CHECKLIST

PART NO	S/N
SKB32100015-301	1003

CSM

FLIGHT PLAN

LM

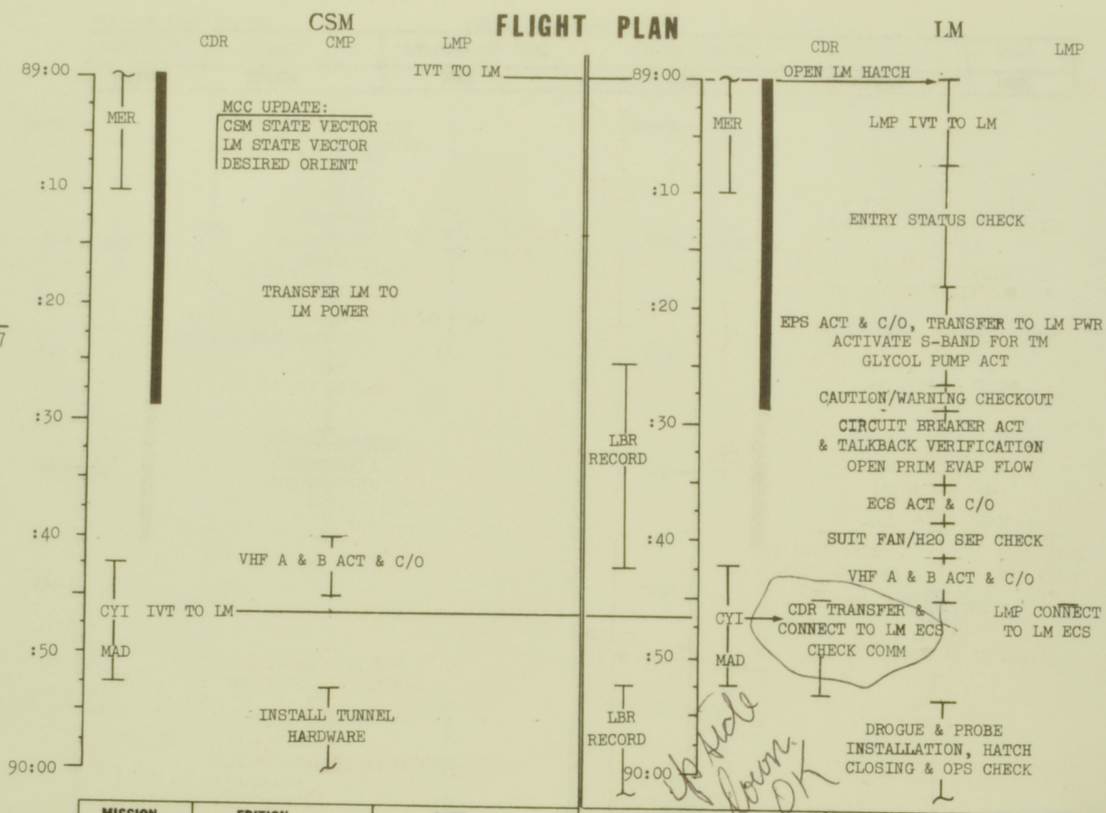


57

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	88:00 - 89:00	5/56-57	3-57

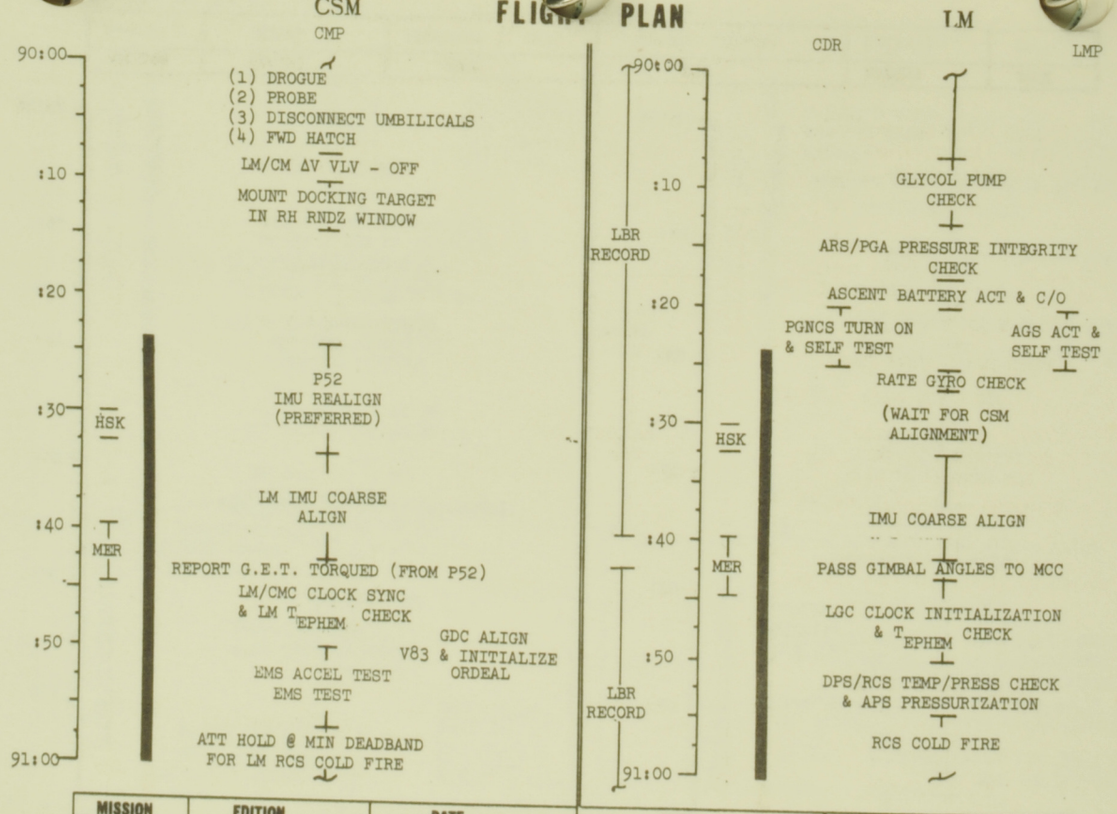
MSC FORM 1186 (SEP 67)

FLIGHT PLANNING BRANCH



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	89:00 - 90:00	5/56-57	3-58

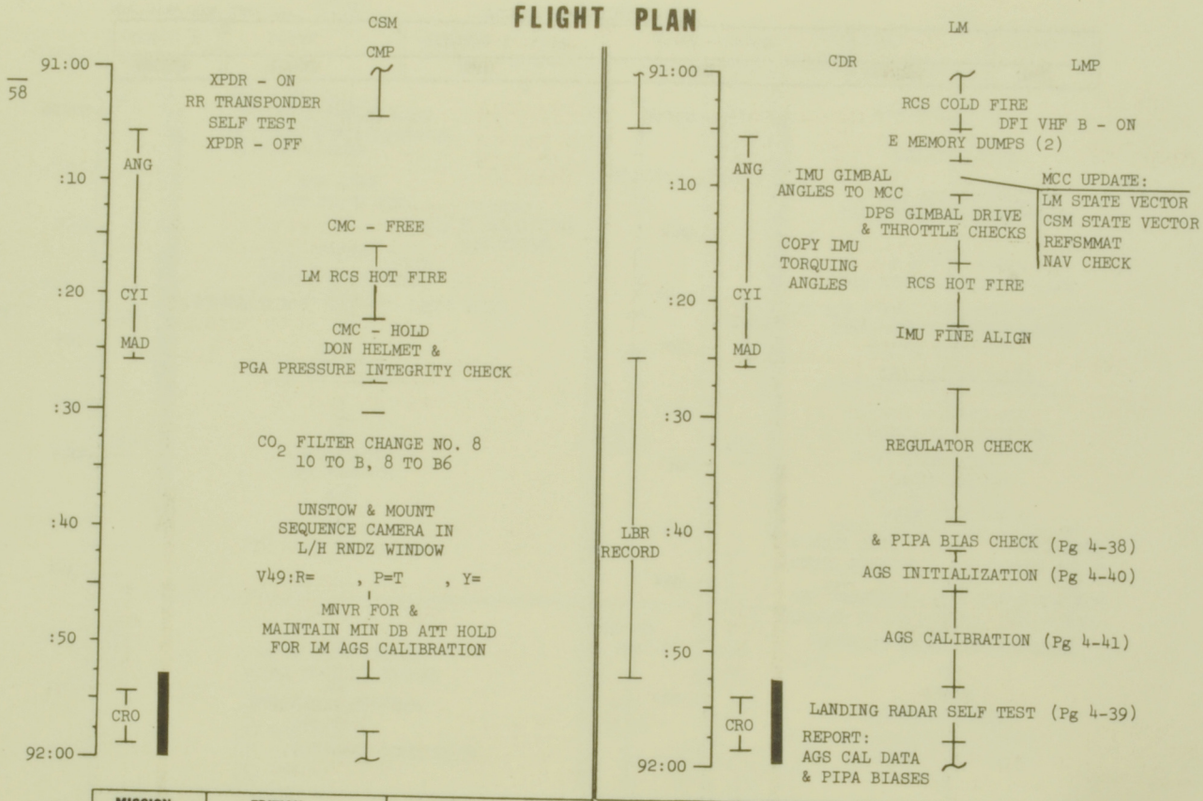
MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	90:00 - 91:00	5/57	3-59

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

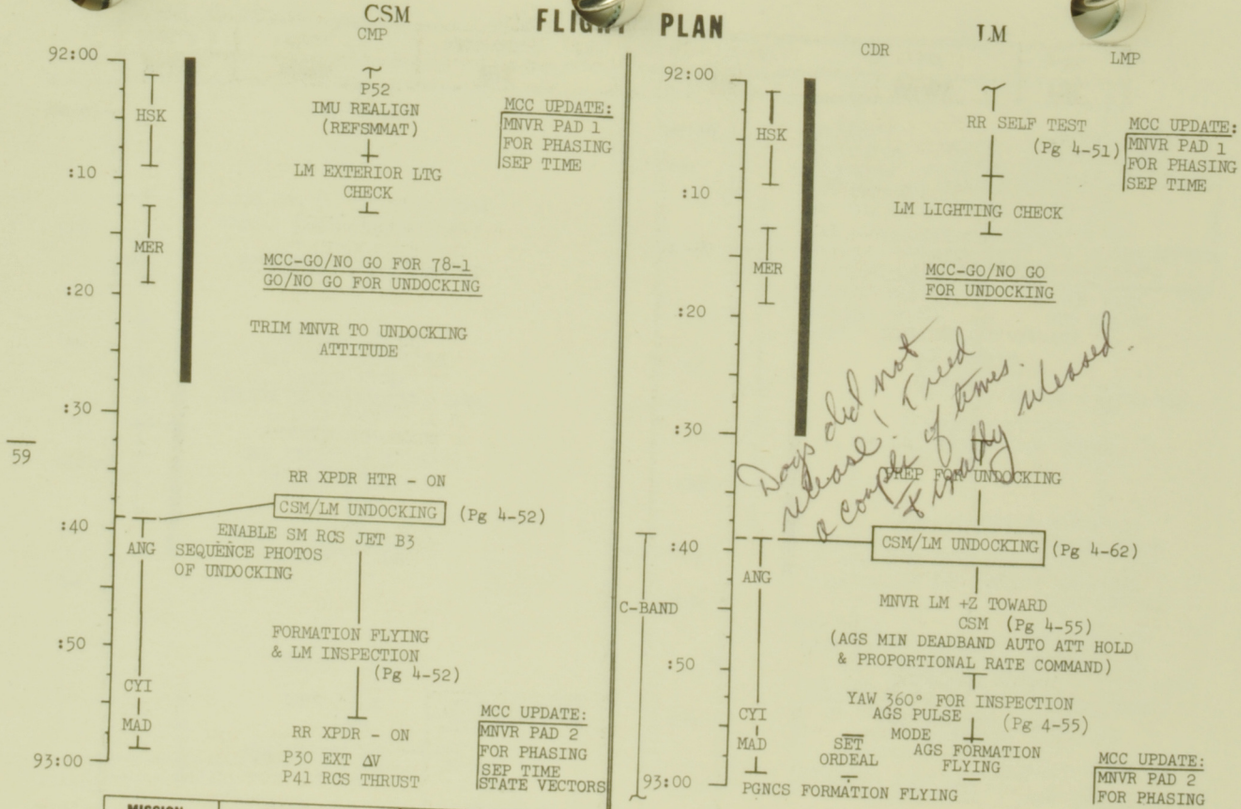
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	91:00 - 92:00	5/57-58	3-60

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

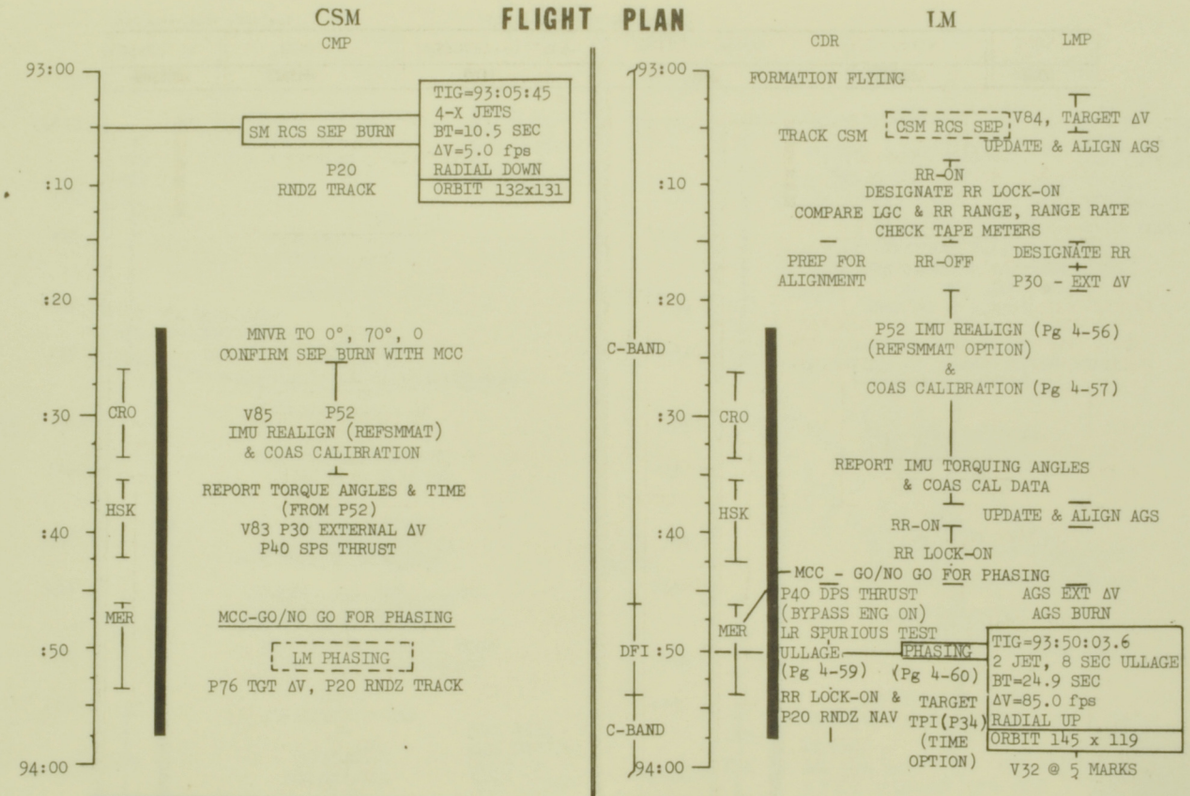
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	92:00 - 93:00	5/58-59	3-61

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

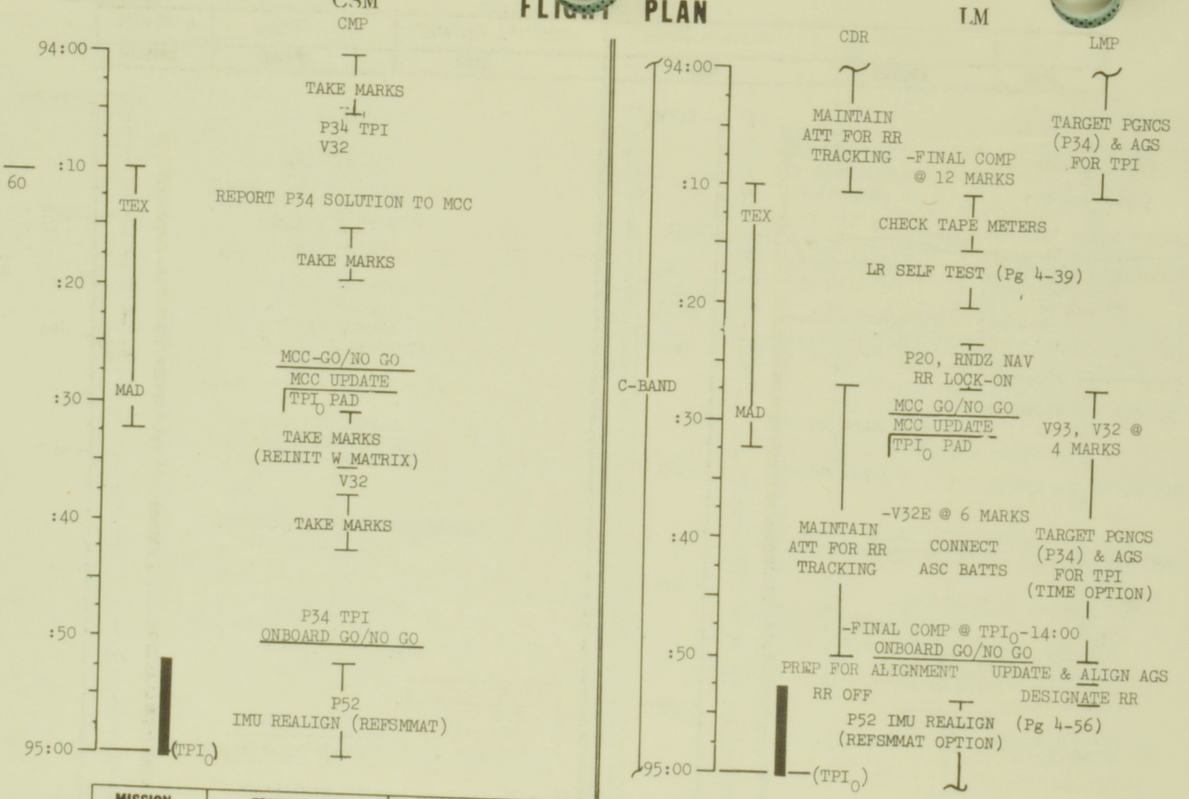
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	93:00 - 94:00	5/59	3-62

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

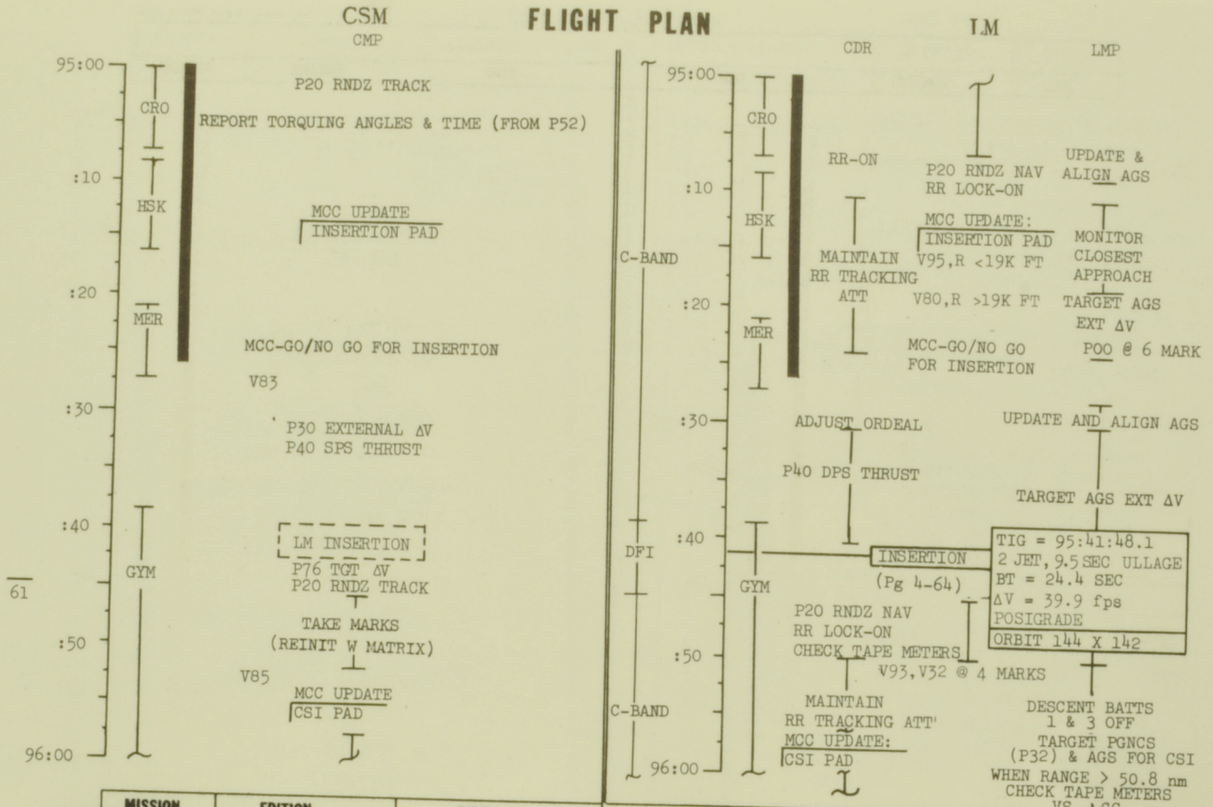
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	94:00 - 95:00	5/59-60	3-63

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

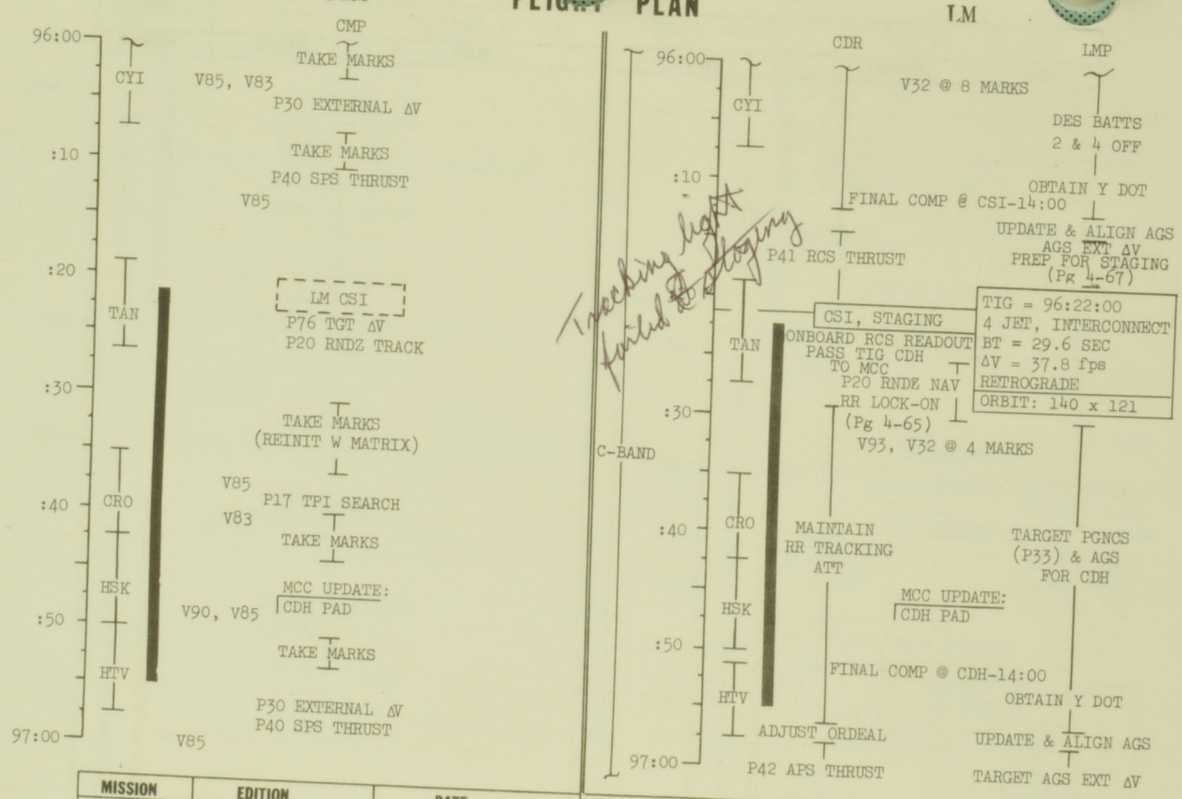
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	95:00 - 96:00	5/60-61	3-64

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

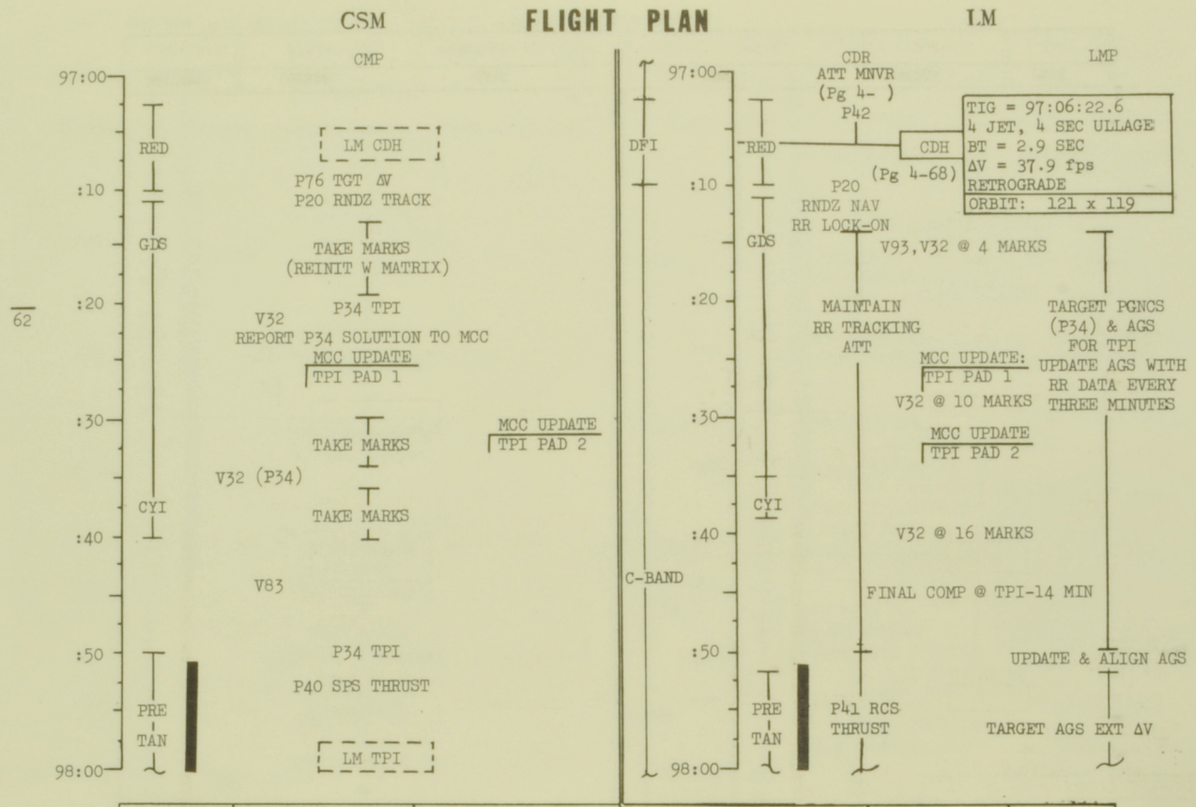
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	96:00 - 97:00	5/61	3-65

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

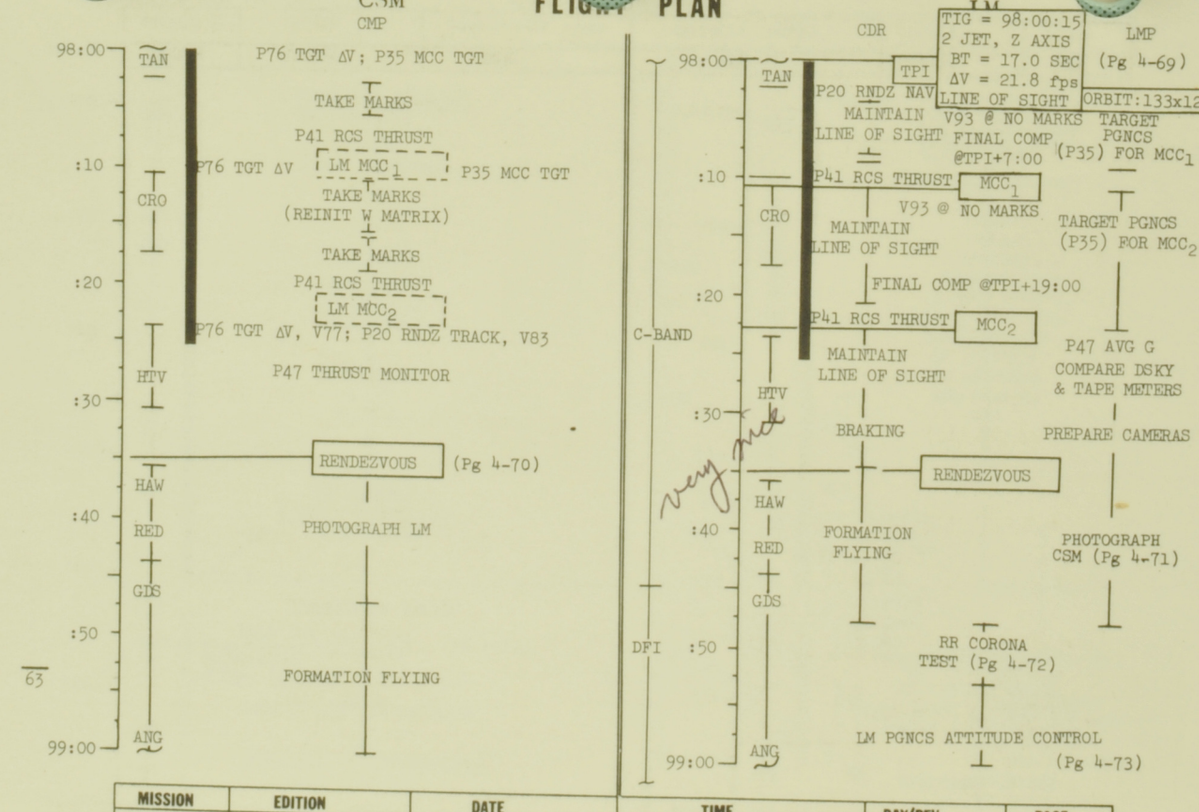
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	97:00 - 98:00	5/61-62	3-66

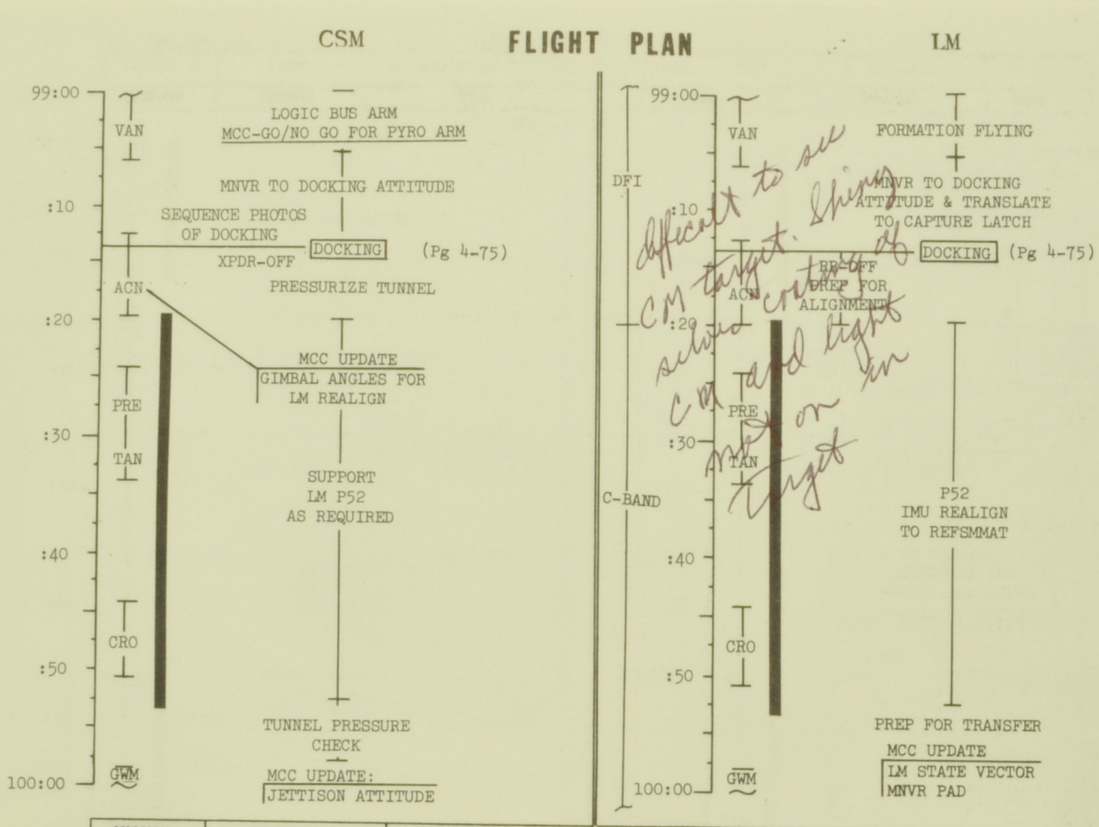
MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

FLIGHT PLAN



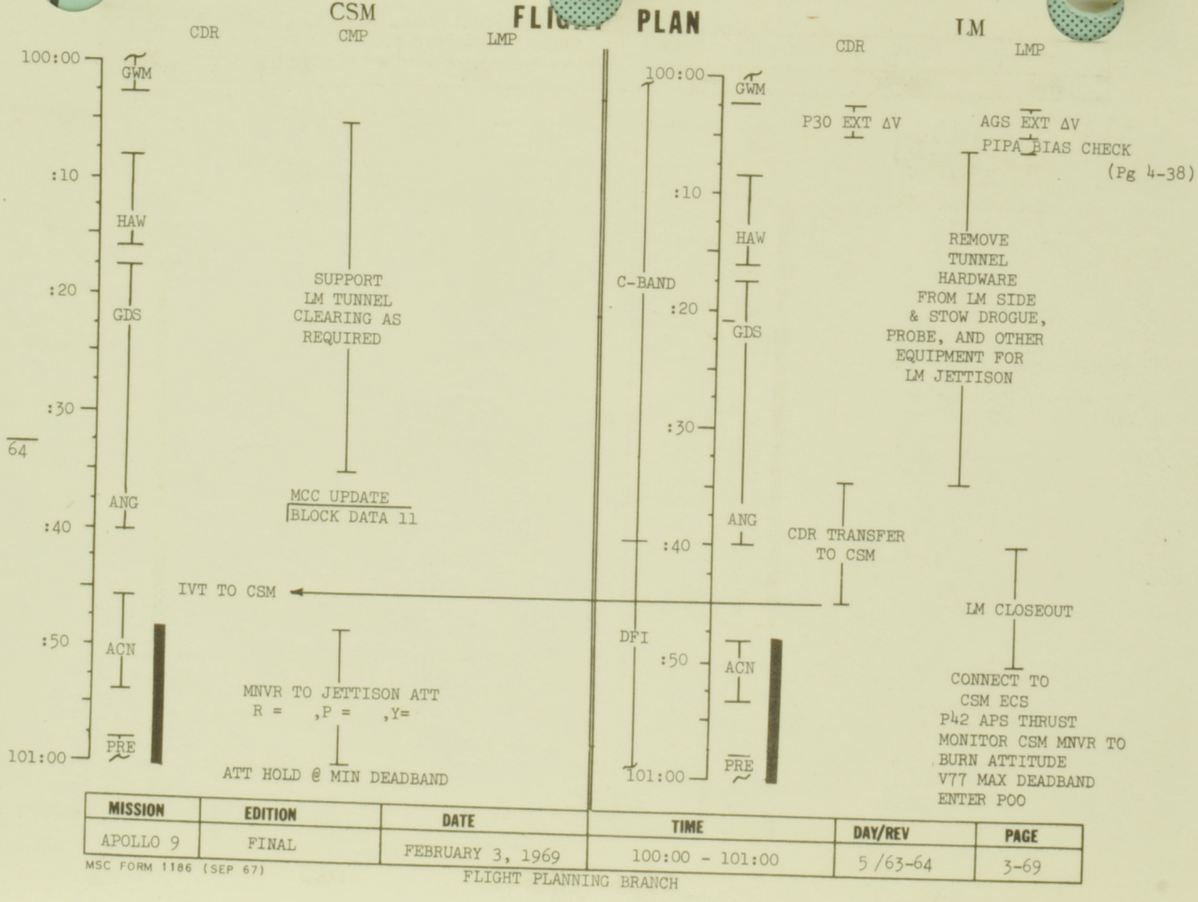
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	98:00 - 99:00	5/62-63	3-67

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH



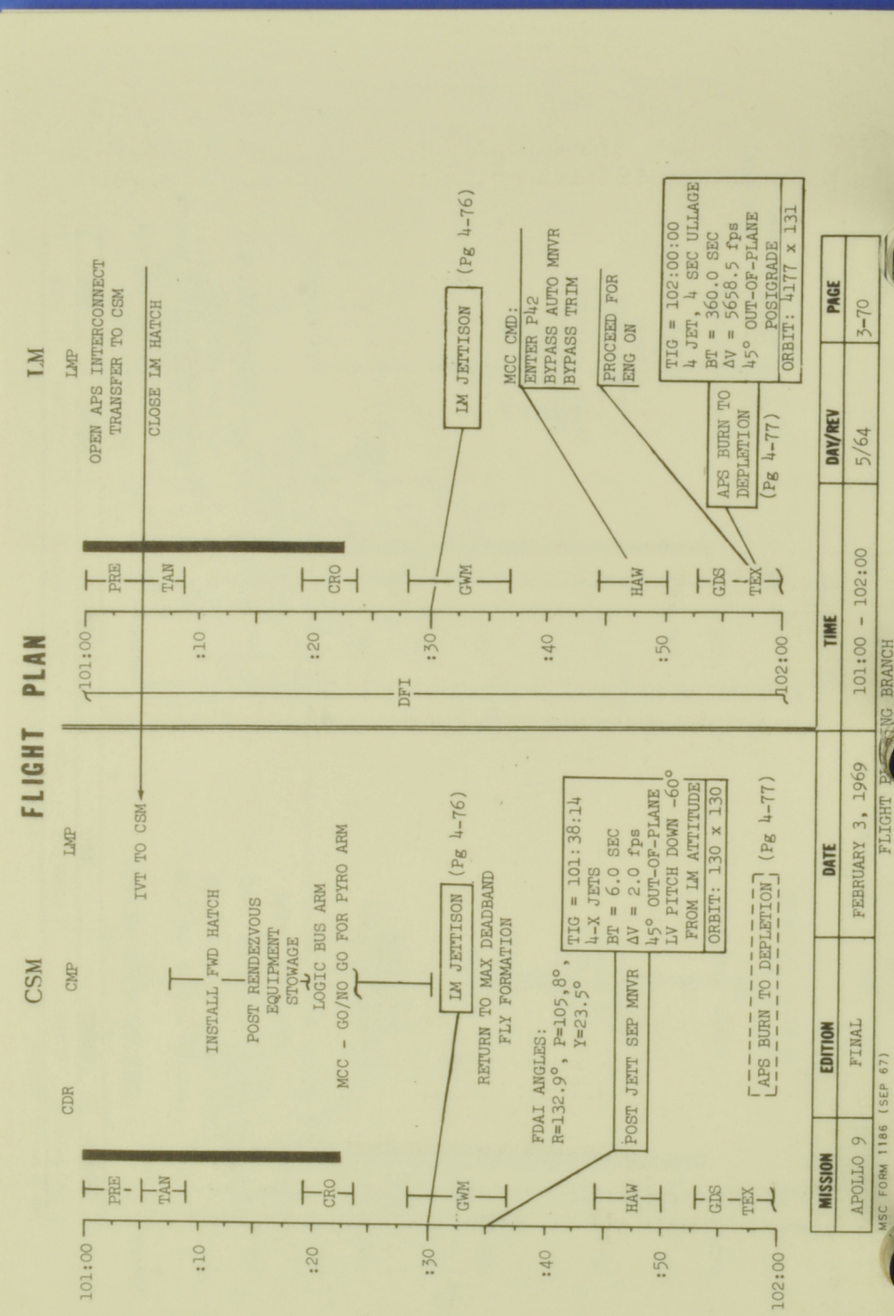
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	99:00 - 100:00	5/63	3-68

MSC FORM 1186 (SEP 67)
FLIGHT PLANNING BRANCH



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	100:00 - 101:00	5/63-64	3-69

MSC FORM 1186 (SEP 67)
FLIGHT PLANNING BRANCH



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	101:00 - 102:00	5/64	3-70

MSC FORM 1186 (SEP 67) FLIGHT PLANNING BRANCH

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

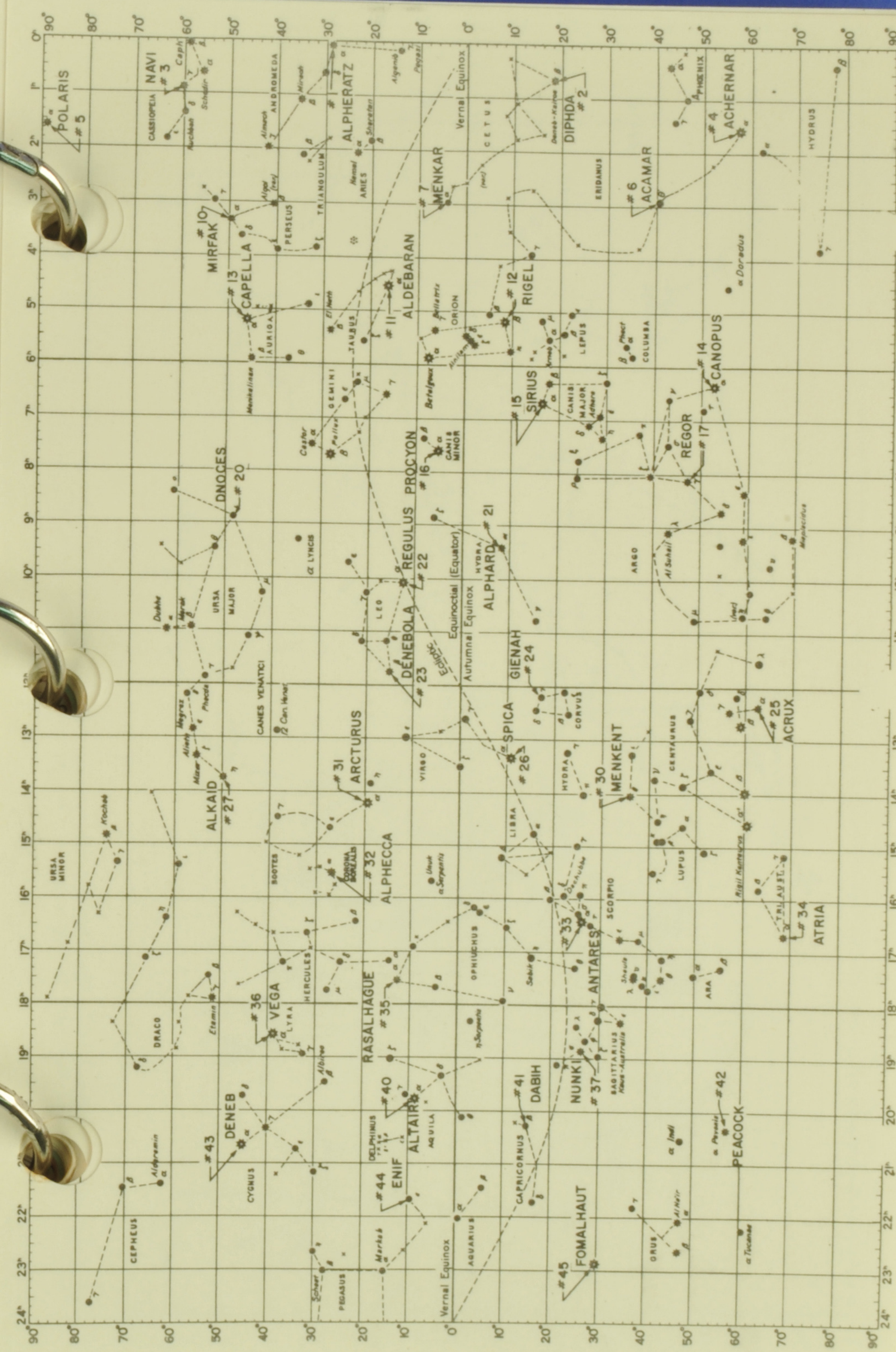
APOLLO IX LM-3

FINAL

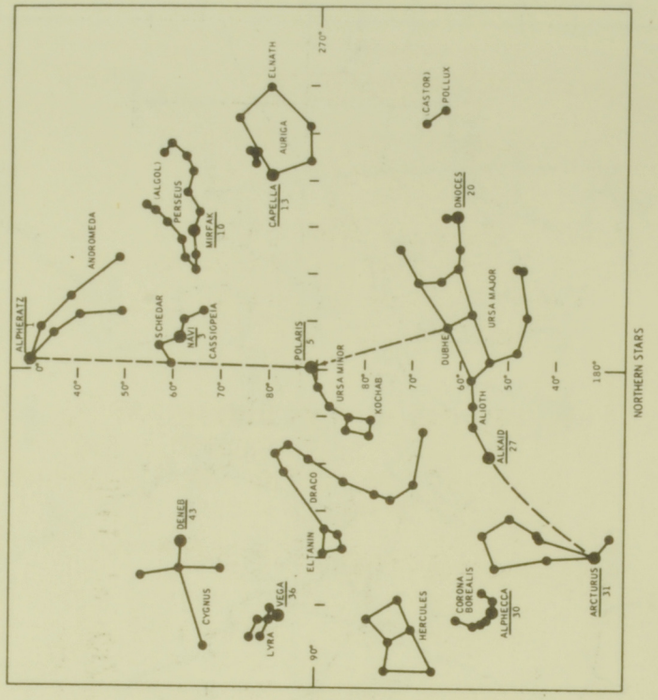
FLIGHT CREW RENDEZVOUS ACTIVATION CHECKLIST

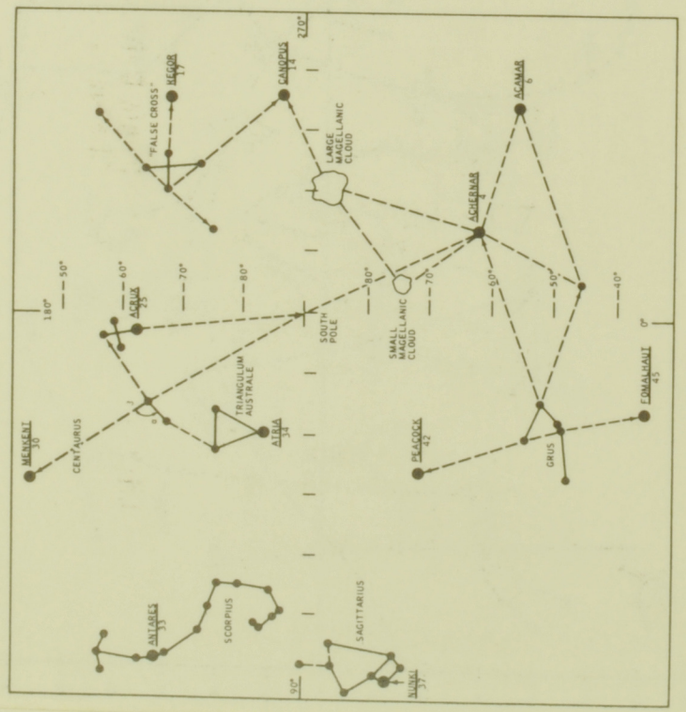
PREPARED BY
GUIDANCE & CONTROL SECTION
FLIGHT CREW SUPPORT DIVISION
FEBRUARY 24, 1969

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS


POLARIS #5
NAVI #3
ALPHERATZ #1
DIPHDA #2
ACHERNAR #4
MIRFAK #10
MENKAR #7
ACAMAR #6
CAPELLA #13
ALDEBARAN #11
RIGEL #12
CANOPUS #14
SIRIUS #15
PROCYON #16
REGOR #17
DNOCES #20
REGULUS #22
ALPHARD #21
DENEBOLA #23
GIENAH #24
ACRUX #25
SPICA #26
ARCTURUS #31
ALKAID #27
MENKENT #30
ALPHECCA #32
ATRIA #34
RASALHAGUE #35
ANTARES #33
VEGA #36
NUNKI #37
DABIH #41
ALTAIR #40
PEACOCK #42
DENEB #43
ENIF #44
FOMALHAUT #45
Vernal Equinox
Autumnal Equinox
Equinoctial (Equator)

ECLIPTIC
ANDROMEDA
PEGASUS
CASSIOPEIA
PERSEUS
CETUS
AURIGA
TAURUS
ORION
ERIDANUS
GEMINI
CANIS MAJOR
"FALSE CROSS"
URSA MAJOR
LEO
HYDRA
VIRGO
CORVUS
CENTAURUS
BOÖTES
CORONA BOREALIS
HERCULES
OPHIUCHUS
SERPENS
LIBRA
SCORPIUS
SAGITTARIUS
CORONA AUSTRALIS
CYGNUS
CAPRICORNUS
GRUS
ALPHERATZ 1
DIPHDA 2
NAVI 3
ACHERNAR 4
FOMALHAUT 45
MIRFAK 10
MENKAR 7
ACAMAR 8
CAPELLA 13
ALDEBARAN 11
RIGEL 12
CANOPUS 14
PROCYON 9
SIRIUS 15
REGOR 17
DNOCES 20
REGULUS 22
ALPHARD 21
DENEBOLA 23
ALKAID 27
ARCTURUS 31
GIENAH 24
SPICA 26
MENKENT 30
ACRUX 25
ALPHECCA 32
RASALHAGUE 35
VEGA 36
ANTARES 33
NUNKI 37
RASALGETHI 41
ALTAIR 40
DENEB 43
PEACOCK 42
ENIF 44
FOMALHAUT 45
80° 70° 60° 50° 40° 30° 20° 10° 0° 10° 20° 30° 40° 50° 60° 70° 80°
0h 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h 13h 14h 15h 16h 17h 18h 19h 20h 21h 22h 23h 24h





RDZ-1

INTRAVEHICULAR TRANSFER TO LM

5 min

Stow In ISA:
- SEQ Camera & 5mm Lens
- 1 CEX368 Mag (L)
- Camera Handle
- CDR & LMP RDZ Charts & Procedures (2), & Update Cards (May Be In LM)

EVA Checklist (1)

LMP Transfer To LM With LMP RDZ Checklist & Flight Plan Card
Actuate CABIN DUMP VALVE & Open Hatch
EXTERIOR LTG - OFF
FLOOD LIGHT - ALL
DES H2O - OPEN

DOCKING TUNNEL INDEX ANGLE ΔΦ _____

Transfer ISA To LM

ENTRY STATUS CHECK

10 min

CB(11)

Row 1&2: All Open

Row 3: HEATERS: RNDZ RDR STBY - Close
LDG RDR - Close
LTG: ANUN/DOCK/COMPNT - Close

Row 4: PGNS: IMU STBY - Close

Row 5: EPS: BAT FEED TIE (2) - Close
CROSS TIE BAL LOADS - Close
DES ECA - Close
DFI PWR - OFF

FDAI 1&2 - INRTL
EARTH/LUNAR - PWR OFF
LTG - OFF
MODE - HOLD/FAST
ALT SET - 130

FUEL & OXID VENT tb-bp
MASTER ARM - OFF

Basic Date Feb 24, 1969
Changed 1

LM-3

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

RDZ-2

ASC He SEL - BOTH
LDG GEAR DEPLOY tb-bp
STAGE-SAFE (Guarded)

4 S-BAND T/R - OFF (VOL-6)
ICS T/R - OFF (VOL-6)
RELAY - OFF
VOX-ICS (VOX SENS-7)
AUDIO CONT - NORM
VHF A&B - OFF (VOL-6)
MASTER VOL - 6
COAS - OFF

5 TTCA (CDR) - JETS (Dn)

6 TIMER CONT - STOP
OVERRIDE ANUN - OFF
OVERRIDE NUM - OFF
OVERRIDE INTEGRAL - OFF
SIDE PANELS - OFF
FLOOD OVHD/FWD - BRIGHT
ANUN/NUM - DIM
INTEGRAL - DIM

7 X-POINTER SCALE - HI MULT
RATE/ERR MON - LDG RDR/CMPTR
ATTITUDE MON - PGNS
GUID CONT - PGNS
MODE SEL - LDG RADAR
RNG/ALT MON - ALT/ALT RT
SHFT/TRUN - +50°
RATE SCALE - 25°/SEC
THR CONT - AUTO
MAN THROT - CDR
ENG ARM - OFF
X-TRANSL - 2 JETS
BAL CPL - ON
ASC He REG 1&2 - tb-gray
DESCENT He REG 1 tb-gray
DESCENT He REG 2 tb-bp
PRPLNT QTY MON - OFF
PRPLNT TEMP/PRESS MON - ASC
HELIUM MON - OFF
ABORT and ABORT STAGE - Flush/Guarded

Basic Date Feb. 24, 1969
Changed

RDZ-3

8 SYS A&B ASC FUEL & ASC OXID (4) - tb-bp
SYS A&B QUAD 1,4,2,3(8)-tb-gray
CRSFD - tb-bp
SYS A&B MAIN SOV - tb-gray
TEMP/PRESS MON - He
RCCA - OFF/RESET
RATE/ERR MON - LDG RDR/CMPTR
ATTITUDE MON - AGS
GLYCOL - PUMP 2
SUIT FAN - 1
02/H20 QTY MON - ASC 2

9 ENG GMBL - ENABLE
DES ENG CMD OVRD - OFF
LDG ANT - DES
RADAR TEST - OFF
TEST MONITOR - ALT XMTR
SLEW RATE - HI
RNDZ RDR - AUTO TRACK
DEAD BAND - MIN
GYRO TEST - ROLL
ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL - ATT HOLD
DET - Up & STOP
TEMP MON - LDG
RCS SYS A/B-2 QUAD 1,2,3,4 - OFF
LTG: SIDE PANELS - OFF
FLOOD - ALL
OVHD/FWD - BRIGHT
EXTERIOR LTG - OFF
LAMP/TONE TEST - OFF
X-POINTER SCALE - HI MULT

Basic Date Feb. 24, 1969
Changed

10 ACA/4 JET (2) - ENABLE
TTCA/TRANSL (2) - ENABLE
RDZ ANT RELEASE - UNSTOWED
AOT - CL, ANGLE - 0000

11 TTCA (LMP) - JETS (Dn)
AGS STATUS - OFF

12 CB(16)
Row 1: All Open
Row 2: LTG: FLOOD - Close

STAB/CONT: ASA - Close
Row 3: All Open
Row 4: HEATERS: S-BD ANT - Close
EPS: DES ECA - Close
CROSS TIE BAL LOADS - Close
BAT FEED TIE (2) - Close

13
POWER/TEMP MON - ED/OFF
INVERTER - OFF
BAT 1,2,3,4 - tb-bp
DES BATS - tb-bp
BAT 5&6 NORMAL & BACK UP FEED (4) tb-bp

14
AUDIO CONT - NORM
S-BAND T/R - OFF (VOL-6)
ICS T/R - OFF (VOL-6)
RELAY - OFF
VOX - ICS (VOX SENS-7)
VHF A&B - OFF (VOL-6)
MASTER VOL - 6
VHF A RCVR VOICE BU - OFF

15
S-BAND MODULATE - PM
XMTR/RCVR - OFF
PWR AMPL - OFF
VOICE - OFF
PCM - OFF
RANGE - OFF/RESET
VHF A XMTR & RCVR - OFF (SQUELCH - 3)
VHF B XMTR & RCVR - OFF (SQUELCH - 3)
TELEMETRY BIOMED - OFF
TELEMETRY - HI
RECORDER - OFF tb-bp
VHF - 1/PLSS TEST
TRACK MODE - OFF
PITCH - +255°
YAW - -30°
S BAND - 2

16
SUIT GAS DIVERTER - PULL/EGRESS
CABIN REPRESS - CLOSE
PLSS FILL - CLOSE
PRESS REG A&B - CLOSE
DES O2 - CLOSE

Basic Date Feb. 24, 1969
Changed —

Basic Date Feb. 24, 1969
Changed —

LM-3

1&2 ASC O2 - CLOSE
SUIT ISOL (2) - SUIT DISC
SUIT CIRCUIT RELIEF - AUTO
CABIN GAS RETURN - AUTO
CO2 CANISTER SEL - PRIM
PRIM & SEC CO2 CANISTER - CLOSE
WATER SEP SEL - PULL/SEP 2
ASC H2O - CLOSE
SEC EVAP FLOW - CLOSE
PRIM EVAP FLOW No. 2 - CLOSE
DES H2O - OPEN
WATER TANK SELECT - DES
SUIT TEMP - COLD
CABIN TEMP - NORM

17
CABIN RELIEF AND DUMP (2) - AUTO

18
DFI PRIMARY - ON, SECONDARY - OFF
UTILITY LIGHTS (Both) - As Required
Fwd Hatch Closed & Locked

EPS ACTIVATION & CHECKOUT 5 min

1
CSM Position LM PWR - RESET Then OFF
LTG: ANUN/NUM - BRIGHT (1 Caution, 9 Power Failure Lts - On)

2
CB(11) INST: SIG CONDR 1 - Close
EPS: XLUNAR BUS TIE - Close
DES ECA CONT - Close
DC BUS VOLT - Close
CB(16) INST: SIG SENSOR - Close
PCM/TE - Close
SIG CONDR 2 - Close
COMM: PRIM S-BD PWR AMPL - Close
PRIM S-BD XMTR/RCVR - Close
PMP - Close
EPS: DISP - Close
DC BUS VOLT - Close
DES ECA CONT - Close
XLUNAR BUS TIE - Close

Basic Date Feb. 24, 1969
Changed —

LM-3

3 CB(11) COMM: VHF B XMTR - Close
VHF B - DATA
TELEMETRY - LO
CSM Record LBR Data

4 Verify BAT 1,2,3,4 - tb-LO
DES BATS - gray
BATS 5&6 NORMAL & BACKUP (4) tb-bp
Check BAT And BUS Voltages (When BUS Voltages Less Than 27v Select High Voltage Taps)

CB(16)EPS:CROSS TIE BAL LOADS-Open
BAT 1 HI VOLTAGE-OFF/RESET tb-bp
BAT 1 HI VOLTAGE - ON tb-gray
Repeat For BATS 2,3,4
CB(16)EPS:CROSS TIE BAL LOADS-Close

5 CB(11) AC BUS B&A: BUS TIE INV 2&1 (4) - Close
AC BUS VOLT - Close
EPS: INV 1 - Close
CB(16) EPS: INV 2 - Close

6 POWER/TEMP MON - AC BUS
INV - 1 Then 2
CB(11) EPS: INV 1 - Open

ACTIVATE S-BAND FOR TM 1 min

1 S-BAND-PM, PRIM, PRIM, VOICE, PCM, RANGE, OFF, LO
S-BAND ANTENNA - As Desired

Basic Date Feb. 24, 1969
Changed Date
LM 2

GLYCOL PUMP ACTIVATION 1 min

CB(16) ECS: DISP - Close
CB(11) ECS: GLYCOL PUMP AUTO TRNFR-Close
GLYCOL PUMP 1 - Close
GLYCOL PUMP AUTO TRNFR - Open
GLYCOL - PUMP 1
CB(11) ECS: GLYCOL PUMP 2 - Close
GLYCOL PUMP AUTO TRNFR - Close

CAUTION/WARNING CHECKOUT 2 min

1 CB(16) INST: CWEA - Close (LGC, CES AC, CES DC Warning Lts, PRE AMPS, HEATER, GLYCOL, ECS Caution Lts, H2O SEP Comp Lts-On)
LTG: ANUN/DOCK/COMPNT - Close
MASTER ALARM - Close (Master Alarm - On)
HEATERS: DISP - Close

RCS TEMP/PRESS MON - Cycle Then He
HTR TEMP MONITOR - Cycle Then LDG
GYRO TEST - POS RT
LAMP/TONE TEST - Check All Positions

Basic Date Feb. 24, 1969
Changed Date
2

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

CIRCUIT BREAKER ACTIVATION 5 min

1 CB(11)

Row 1: All Closed Except:
AC BUS B&A: AOT LAMP (2) - Open
RNDZ RDR - Open

Row 2: AC BUS A: RNG/RNG RT ALT/ALT RT - Close
All Closed Except:
RCS SYS A: QUAD 4,3,2,1 TCA (4) - Open

Row 3: All Closed Except:
STAB/CONT: ABORT STAGE - Open
(Possible Master Alarm-On With ATCA [PGNS])
AELD - Open
ATT DIR CONT - Open
ED: LDG GEAR FLAG - Open

Row 4: All Closed Except:
ECS: SUIT FAN 1 - Open
PGNS: LDG RDR - Open
RNDZ RDR - Open
(Possible LGC Warning and RESTART Lt - On With LGC/DSKY)
IMU OPR - Open

Row 5: All Closed Except:
EPS: CROSS TIE BUS - Open
ASC ECA CONT - Open
INV 1 - Open
SLA/LEM ANT TRNFR (2) - Open
R/D INST A&B - Open
DFI PWR - OFF

2 CB(16)

Row 1: All Closed Except:
RCS: SYS B QUAD 1,2,3,4 TCA - Open

Row 2: All Closed Except:
STAB/CONT: AEA - Open
AELD - Open
ABORT STAGE - Open

Row 3: All Closed Except:
COMM: TV - Open
ECS: GLYCOL PUMP SEC - Open
(Suit Fan Comp Lt-On With Suit Fan ΔP & Master Alarm May Go On With CO2 SENSOR)

Row 4: All Closed Except:
CAMR: SEQ - Open

Basic Date Feb. 24, 1969
Changed Mar. 25, 1969

EPS: ASC ECA CONT - Open
CROSS TIE BUS - Open

3 MISSION TIMER - SET

4 PRIM EVAP FLOW - OPEN (When Glycol Temp >60°F)

5 RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO

6 CB(16) INST: CWEA - Open & Reclose (Master Alarm, HEATER, ECS, GLYCOL Caution, H2O SEP, And SUIT FAN Lts - On)

TB VERIFICATION — 2 min

1 FUEL & OXID VENT (2) - bp
LDG GEAR DEPLOY - bp

2 ASCENT He REG 1&2 - gray
DESCENT He REG 1 - bp
DESCENT He REG 2 - bp

3 SYS A&B ASC FUEL & OXID (4) - bp
SYS A&B QUAD 1,4,2,3(8) - gray
CRSFD - bp
SYS A&B MAIN SOV - gray

4 TAPE - bp

ECS ACTIVATION & CHECKOUT — 5 min

1 O2/H2O QTY MON - ASC 2, ASC 1, DES

2 SUIT ISOL (Both) - SUIT FLOW
SUIT ISOL (Both) - ACTUATE OVRD (Suit Discon)
DES O2 - OPEN
SUIT GAS DIVERTER - PUSH/CABIN
PRESS REG A&B - EGRESS (Suit Gas Diverter Automatically Extends & Cabin Fans Go Off)

Basic Date Feb. 24, 1969
Changed

SUIT PRESS 4.8 To 5.2 psia ~~TBD~~
CB(16) ECS: CABIN FAN CONT - Open (Cabin Fans Go On)

SUIT FAN - 2 (Master Alarm, SUIT/FAN Warning Lt-On Momentarily, ECS Caution Lt, H2O Sep Comp Lt - On Then Off In <2min)
PART PRESS CO2 <7.6 mm hg

SUIT FAN/H2O SEP CHECK — 2 min

1 CB(16) ECS: SUIT FAN 2 - Open (Master Alarm, SUIT/FAN Warning Lt, Suit Fan Comp Lt-On)

2 When ECS Caution Lt & H2O SEP Lt-On Master Alarm - On
CB(11) ECS: SUIT FAN 1 - Close
H2O SEP SEL - PUSH/SEP 1
SUIT FAN - 1 (SUIT/FAN Warning Lt, Suit Fan Comp Lt - Out, ECS Caution Lt, H2O Sep Comp Lt - Out In <2 min)
CB(16) ECS: SUIT FAN 2 - Close

Basic Date Feb. 24, 1969
Changed

S-BAND AND VHF ACTIVATION — ~~TBD~~

1 Set Comm Configuration
S-Band - PM,PRIM,PRIM,VOICE,PCM,RANGE,L/R,LO
VHF - ON,ON,VOICE,ON
S-BAND & VHF ANTENNA - As Desired
AUDIO (Both):
S-BAND - T/R (Vol To Just Hear MSFN)
ICS - T/R
RELAY - OFF
AUDIO CONT - NORM
VOX - ICS
VHF A (CDR) - T/R
(LMP) - OFF
VHF B (CDR) - OFF
(LMP) - T/R
Connect Umbilical To Right Side (Red/Red - Blue/Blue)

LMP PTT & VHB INOP

LM-3

2 CSM Configure Simplex B And Set LMP
Suit Pwr To Off
Connect To LM Comm Umbilical(Audio,Biomed)
TAPE - ON
Conduct COMM Check,Adjust Squelch (ACA &
Umbilical PTT)

3 AUDIO (LMP): VOX - ICS/XMTR
Conduct Comm Check (Adjust VOX SENS)
VOX - ICS

4 CSM Configure For Simplex A
AUDIO (LMP): VHF A - T/R
VHF B - OFF
Conduct COMM Check, Adjust Squelch

5 CSM Configure For LM Data
VHF B XMTR - DATA
VHF B RCVR - OFF
TELEMETRY - LO

6 VHF ANTENNA - Select Other Antenna
Perform COMM Check With CSM

7 CSM Select Other Antenna
Perform COMM Check With CSM

8 VHF ANTENNA - Select Original Antenna
Conduct COMM Check
TAPE - OFF

9 Select Best Antenna Combination

Basic Date Feb. 24, 1969
Changed
Changed

CDR TRANSFER & CREW CONNECT 10 min

1 CSM Set LMP Suit Flow Control To Off
LMP SUIT ISOL - SUIT FLOW (Verify Flow)
Disconnect Umbilical And Pass To CSM
Receive And Stow ISA
LMP Configure Cabin (Straps, Utility
Lights, Cards, Restraints, etc.)

2 CDR Transfer To LM With CDR RDZ Checklist
Connect To CDR Hoses (Red/Red,Blue/Blue)
CDR SUIT ISOL - SUIT FLOW
Connect To LM Comm Umbilical (Audio,Biomed)
Conduct Comm Check (ACA & Umbilical PTT)

3 CDR AUDIO: VOX - ICS/XMTR
Conduct Comm Check (Adjust VOX SENS)

4 CDR AUDIO: VOX - ICS

CDR HTR CHECK NO GOOD

OPS CHECK 5 min

1 OPS O2 PRESS 5380 To 6380 psi
O2 HOSE - LOCKED
OPS O2 - ON (O2 Press 3.4 To 4.0 psi)
Verify O2 Flow
HEATER TEST BUTTON - DEPRESS
(At Least 1 Lt - On)
OPS O2 - OFF
Verify REG Press Gage Reads Zero
In About 4 min

2 STOW OPS (Both On Pallet)

DROGUE AND PROBE INSTALLATION 10 min

1 Both Electrical Umbilicals Disconnect,
And Secured
Drogue Lock Lever Engaged And Flush
Three Capture Latches Engaged and Locked
(Before & After Preload)

Basic Date Feb. 24, 1969
Changed

LM Hatch Exterior Insulation OK, Flaps Secured

Close & Secure Hatch
CABIN DUMP VALVE - AUTO
CABIN REPRESS - AUTO
PRESS REG A&B - CABIN
SUIT GAS DIVERTER - PUSH/CABIN
CB(16) ECS: CABIN FAN CONT - Close

Basic Date 2 Feb. 24, 1969
Changed ___
Changed ___

GLYCOL PUMP CHECK

5 min

1 CB(11) ECS: GLYCOL PUMP 1 - Open (Master Alarm, And ECS Caution Lt On Momentarily
CB(11) ECS: GLYCOL PUMP 1 - Close, (Check Glycol Comp Lt-On)

2 GLYCOL - INST(SEC) (Note Glycol Press)
CB(16) ECS: GLYCOL PUMP SEC - Close (10-20 psi Rise) ~~[illegible]~~ — 15 ΔP
ECS: GLYCOL PUMP SEC - Open

3 GLYCOL - PUMP 2 (15-30 psi)
CB(11) ECS: GLYCOL PUMP AUTO TRNFR - Open
GLYCOL - PUMP 1 (Master Alarm & ECS Caution Lt On Momentarily, 15-30 psi)
CB(11) ECS: GLYCOL PUMP AUTO TRNFR - Close

ARS/PGA PRESSURE INTEGRITY CHECK

5 min

SUIT GAS DIVERTER - PULL/EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - CLOSE
PRESS REG A - CLOSE
PRESS REG B - DIRECT O2 (Suit Press To 8.85 psia)
PRESS REG B - CLOSE (Monitor Cuff Gage Decay <.3 psi In 1 min)

LMP NOT ON LOOP DUE TO RIGHT EAR NOT CLEARING

2 CO2 CANISTER SEL - SECONDARY (CO2 Comp Lt - On Monitor Cuff Gage Decay at <.3 psi In 1 min)

3 CO2 CANISTER SEL-PRIMARY(CO2 Comp Lt-Off)
SUIT CIRCUIT RELIEF - AUTO
PRESS REG A&B - CABIN
CABIN GAS RETURN - AUTO
SUIT GAS DIVERTER - PUSH/CABIN

Basic Date Feb. 24, 1969
Changed ___
LM-3

RDZ-15

ASCENT BATTERY ACTIVATION & CHECKOUT 2 min

1 CB(16) EPS: ASC ECA CONT - Close
CROSS TIE BAL LOADS - Open

2 POWER/TEMP MON - BAT 5
BAT 5 NORMAL FEED - ON tb-gray
Verify BAT Current Then BAT & SE BUS Voltage
BAT 1,2 HI VOLT - OFF/RESET tb-bp
(Possible Master Alarm and DC BUS Warning Lt - On)

3 POWER/TEMP MON - BAT 6
BAT 6 BACKUP FEED - ON tb-gray
Verify BAT Current Then BAT & SE BUS Voltage
BAT 5 NORMAL FEED - OFF/RESET tb-bp

4 POWER/TEMP MON - BAT 1
BAT 1,2, HI VOLT - ON
BAT 6 BACKUP FEED - OFF/RESET tb-bp

5 POWER/TEMP MON - BAT 6
BAT 6 NORMAL FEED - ON tb-gray
Verify BAT Current Then BAT & CDR BUS Voltage
BAT 3,4 HI VOLT -OFF/RESET tb-bp
(Possible Master Alarm And DC BUS Warning Lt - On)

6 POWER/TEMP MON - BAT 5
BAT 5 BACKUP FEED - ON tb-gray
Verify BAT Current Then BAT & CDR BUS Voltage
BAT 6 NORMAL FEED - OFF/RESET tb-bp

7 POWER/TEMP MON - BAT 4
BAT 3, 4 HI VOLT - ON tb-gray
BAT 5 BACKUP FEED - OFF/RESET tb-bp

8 CB(16) EPS: ASC ECA CONT - Open
CROSS TIE BAL LOADS - Close

Basic Date Feb. 24, 1969
Changed
Changed

RDZ-15/16

ASCENT BATTERY ACTIVATION & CHECKOUT

1 CB(16) EPS: ASC ECA CONT - Close

2 POWER/TEMP MON - BAT 5
BAT 5 NORMAL FEED - ON tb-Gray
Verify Bat Current

3 POWER/TEMP MON - BAT 6
BAT 6 NORMAL FEED - ON tb-Gray
Verify Bat Current

4 BAT 1,2,3,4 HI VOLT - OFF/RESET tb(4)-bp
Verify Bats 1,2,3,4 Current Zero

5 BAT 5,6 BACKUP FEED - ON tb(2)-Gray
BAT 5,6 NORMAL FEED - OFF/RESET tb(2)-bp
Verify Bat 5,6 Current

6 BAT 1,2,3,4 HI VOLT - ON tb(4)-Gray
Verify Bat 1,2,3,4, Current
BAT 5,6, BACKUP FEED - OFF/RESET tb(2)-bp
Verify Bat 5,6 Current Zero

7 CB(16) EPS: ASC ECA CONT - Open

8 REPORT ED BAT VOLTAGE TO MSFN
BAT A 36.8 BAT B 37.5

BUSSES 29.0 VDC
ON ASC BATTS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

RDZ-17

ON LGC/DSKY CB-CLOSE WE WERE NOT IN STBY - INSTEAD F37 P06

PGNS TURN ON & SELF TEST — 5 min

1		If STBY Lt-On, PRO V36E V21NO1E, 3000E, 2176E, E 3011E, 201E, E 1642E, 37777E V66E
2		CB(11) PGNS IMU OPR - Close (NO ATT Lt-On For 90 sec)
3		V35E
	F 88 88	DSKY LIGHT CHECK (Master Alarm, LGC, ISS Warning And All DSKY Lights - On For 5 sec) Key RSET When NO ATT - Off +20 sec, V37E00E
4		V25 NO1E, 1365E
	F 21 01	E,E,E
5		V15 NO1E, 1365E
	15 01	R1, R2, R3 All Zero
6		V21 N27E, 10E INITIATE SELF TEST
7		KEY REL
	15 01	R1 Number Of Errors R2 Number Of Tests Started R3 Number Of Tests Successful (Test Successful When R2 ≥3)(78 sec) *PROG Lt - On * *V05N09E 01102 Self Test Error* *N08E Record For MSFN * * R1 _____ * * R2 _____ * * R3 _____ *
8		V21 N27E 0E TERMINATE TEST

Basic Date Changed — Feb 24, 1969

LM-3

LM-3

✓

AGS ACTIVATION, SELF TEST — 2 min

1 AGS STATUS - STBY
CB(16)STAB/CONT: AEA - Close
AGS STATUS - OPERATE
(Master Alarm & AGS Warning Lt - On, Then Off)

2 6666 (OPR ERR - On)

3 000+88888

4 123 - 45679

5 412R + 1 SELF TEST SATISFACTORY
+ 3 LOGIC TEST FAILURE
+ 4 MEMORY TEST FAILURE
+ 7 LOGIC AND MEMORY TEST FAILURE
(To Reinitiate Test Set 412 + 0)

6 574R (+) DESCENT STAGE FLAG (+Not Staged)

7 604R(+) LUNAR SURFACE FLAG (+Not On Lunar Surface)

8 612R(+0000) STAGING SEQ COUNTER (+00000 For Att Hold At Abort Stage)

✓

RATE GYRO CHECK 89:52 — 2 min

1 RATE SCALE - 25°/SEC
GYRO TEST - POS RT (Roll Rate +5°/sec)
GYRO TEST - NEG RT (Roll Rate -5°/sec)
GYRO TEST - PITCH (Repeat Test)
GYRO TEST - YAW (Repeat Test)

2 RATE SCALE - 5°/SEC
Repeat Tests

90:32 — 90:38

✓

**LM DOCKED IMU ALIGNMENT — 7 min

1 Verify CSM In MIN DB ATT HOLD Until Coarse Align Complete

2 Calculate LM Gimbal Angles:

OG	IG	MG
300.26	090.00°	
+ 2.10 ΔΦ		
302.36		360.00
- 147.49 CM	+ 290.00 CM	- 346.71 CM
+ 154.87 LM	+620.00 LM	+13.29 LM

3 F 21 22 V41 N20E COARSE ALIGN IMU
LOAD ICDU ANGLES OG, IG, MG (.01°)
(NO ATT Lt - On, FDAI Torques)
*PROG Lt - on *
*V05N09E 00211 COARSE *
* ALIGN ERROR, GO *
* TO 3 *

4 V40 N20E ZERO CDU (NO ATT Lt - Off)
Notify CSM ATT HOLD No Longer Required

5 F 21 07 V25 N07E
SET REFSMFLG
77E, 10000E, 1E
V01 N01E,77E,Confirm Bit 13 Set

6 V37E51E, PRO, V37E00E

7 V06 N20
06 20 On CSM MARK - ENTR
Copy OG, IG, MG, CSM & LM

	OG	IG	MG
	147.35 CM	289.80 CM	346.53 CM
	154.76 LM	019.07 LM	013.05 LM

Voice Angles To MSFN

8 Copy Ground Calculated Gyro Torquing Angles
91:06 X-00370, Y-00790, Z-00310

9 V42E FINE ALIGN IMU 3 min
F 21 93 LOAD GYRO TOROUING ANGLES X,Y,Z (.001°)

10 V16 N93E
F 16 93 MONITOR TORQUING

LGC CLOCK INITIALIZATION 8 min

1 5024 5040 -16 (-17) V37E 00E 90:00:00

2 V25 N36E Load CSM Time But Do Not ENTR
Seconds, On CSM MARK - ENTR

3 0188 0211 -23 1037 V06 N65 ON CSM MARK - ENTR
COMPUTE CSM/LM Δ TIME
Perform Several Times Then

4 1051 -14 V55E LOAD Δ TIME

379 383 -4 | 2241 2250
1359 1356 +3 | 3038 3038 0

SET TEPHEM 90:03:00 2 min

1 00007 35016 CSM V05 N01E, 1706E And Read TEPHEM

2 31153 V25 N01E, 1706E (Load TEPHEM) E

3 V05 N01E, 1706E Verify TEPHEM

Basic Date Changed

Feb. 24, 1969

DPS,RCS TEMP/PRESS CHECK, APS PRESSURIZATION 90:20 4 min

PRPLNT QTY MON - DES 1, DES 2, Then OFF
(Reading Not Valid)

2 PRPLNT TEMP/PRESS MON
DES 2&1 (50° -75°F, 238-253 psi)
ASC (50° -90°F, 80-200 psi)

3 HELIUM MON
DES AMB PRESS (238-253 psi)
DES SUPCRIT PRESS (1320-1435 psi)
ASC TEMP 1&2 (30°-140°F)
ASC PRESS 1&2 (2720-3500 psi)
OFF

4 ASCENT He REG 1&2-Open tb(2)-gray
ASC He SEL - BOTH
MASTER ARM - ON
ASC He PRESS - FIRE
MASTER ARM - OFF (Master Alarm - On)

PRPLNT TEMP/PRESS MON 68-68 190-190
ASC TEMP/PRESS (50°-90°/172-203 psi)
DES 1 63-63 2840-2820-HC

5 RCS QUANTITY A&B 95% 98-97
RCS TEMP/PRESS MON:
He (2475-3325 psi) 2800-2780
PRPLNT (40°-100°F) (178-192 psi) 67-68 180-180
FUEL MANF (175-189 psi) 182-180
OXID MANF (175-189 psi) 182-181
He ~~0867~~

6 HTR: RCS TEMP MONITOR - QUAD 1,2,3,4
(120°-190°F)

7 RCS SYS A&B ASCENT FEED 2 (2) - CLOSE
RCS SYS A&B ASCENT FEED 1 (2) - OPEN
ASC FUEL & ASC OXID tb(4) Remain bp

8

Basic Date Changed

Feb. 24, 1969

LM-2

90:31 ✓

RCS COLD FIRE

8 min ~~8~~ 4

1 CSM MIN DEAD BAND And ATT HOLD
X-TRANSL - 4 JETS
Verify QUAD TEMP >~~100~~ 120°F
SYS A&B QUAD ISOL (8)-OPEN tb-gray
ATTITUDE CONTROL (3)-MODE CONT
MODE CONTROL-ATT HOLD

2 V48E LOAD DAP, 02012E

3 V77E
V15 N01E, 42E
CDR ACA (To Soft Stop)
Roll Right - R3 00051
Roll Left - 77726
Pitch Up - R1 00051
Pitch Down - 77726
Yaw Right - R2 77726
Yaw Left - 00051

4 LMP Repeat Test

5 V11 N10E, 5E
CDR ACA
Roll Right - R1 00245
Roll Left - 00132
Pitch Up - R1 00226
Pitch Down - 00151
CDR TTCA
Up - R1 00252
Down- 00125

6 LMP Repeat Test

7 E6E
CDR ACA
Yaw Right - R1 00252
Yaw Left - 00125
CDR TTCA
Right - R1 00220
Left - 00140
Fwd - R1 00011
Aft - 00006

Basic Date Feb. 24, 1969
Changed

LM-3

Basic Date Feb. 24, 1969
Changed

8 LMP Repeat Test

9 V76E, V11 N10E, 31E R1 67777
CDR ACA
Roll Right - R1 27757
Roll Left - 27737
Pitch Up - R1 27776
Pitch Down - 27775
Yaw Right - R1 27767
Yaw Left - 27773

10 LMP Repeat Test

11 MODE CONTROL - AUTO R1 57777

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

092:00:00			T
−	027.99		φ(+N)
+	146.31		λ(+E)
+	0124.5	+ +	H NAV CHECK

**ERASABLE MEMORY DUMP — 1 min

1 — CB(11) R/D INST B - Close
TLM-HI → Verify MSFN Contact
V74E (42 sec - 2 Dumps)

**REFSMMAT AND STATE VECTOR UPDATE — 3 min

1 — V37E 00E

2 — MSFN Uplink REFSMMAT & State Vector And Nav Check Pad
(Unlink Acty Lt - On Then Off When Uplink Completed)

**GIMBAL DRIVE AND THROTTLE TEST — 4 min

THR CONT - MAN
MAN THROT - SE
TTCA (Both) - THROTTLE(UP)MIN POSITION

2 — Verify MSFN Contact
V48E
F 01 46 — DAP CONFIGURATION
R1 02012
PRO

3 — F 06 47 — LM WT, CSM WT
R1 22145
R2 27009 (lb)
PRO

4 — F 06 48 — ENGINE GIMBAL TRIM, PITCH, ROLL (.01°)
R1 +00428 ~~+00510~~ (+00458)
R2 +00730 ~~+00725~~ (+00731)
Verify MODE CONTROL - AUTO
ENGINE GIMBL - ENABLE
ENGINE ARM - DES
PRO (Master Alarm, GDA/RCCA Warning Lt-On When Gimbals Reach Limits)

Basic Date — Changed — Feb. 24, 1969

LM-3

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

5		TTCA (LMP) - MIN, Then SOFT STOP (51%) Then MAX (Off Scale High) Then MIN MAN THROT - CDR TTCA (CDR) - MIN, Then SOFT STOP (51%) Then MAX (Off Scale High) Then MIN
6		THR CONT - AUTO
7	F 50 48	TRIM COMPLETE ENG ARM - OFF(GDA/RCCA Warning Lt-Off) TTCA (Both)- JETS (DN) PRO MSFN Verifies Final GDA Position; If Gimbal Angles Differ From Desired Values By More Than 0.1° Repeat V48
8		CB(11) STAB/CONT: DECA PWR - Open CB(12) STAB/CONT: DES ENG OVRD - Open

Basic Date Feb. 24, 1969
Changed Feb. 25, 1969

LM-3

**RCS HOT FIRE 91:18 - 91:21 5 min

1	Notify CSM Verify HBR With MSFN Verify RCS QUAD TEMP 1,2,3,4 120°-190°F For At Least 25 min CB(16) INST: CWEA - Open & Reclose (Master Alarm - On) GUID CONT - AGS X-TRANSL - 4 JETS DEAD BAND - MAX ATTITUDE CONTROL (3) - MODE CONT MODE CONTROL - ATT HOLD
2	CDR ACA (Deflect Slowly To Soft Stop, Pause At Null) Roll Right, Left, Pitch Up, Down, Yaw Right, Left. (Possible Master Alarm, RCS TCA Caution Lt - On tb - red) Verify MSFN Read RCS Data
	ATTITUDE CONTROL (3) - PULSE CB(11) STAB/CONT: ATT DIR CONT - Close CDR ACA (Deflect Hardover, Pause at Null) Roll Right, Left, Pitch Up, Down, Yaw Right, Left (Possible Master Alarm, RCS TCA Caution Lt - On, tb - red)
4	CB(11) RCS: SYS A QUAD 4,3,2,1 - Close CB(16) RCS: SYS B QUAD 1,2,3,4 - Close CB(16) INST: CWEA - Open & Reclose CDR TTCA Up, Down, Right, Left, Fwd, Aft
5	V76E GUID CONT - PGNS CDR TTCA (Pause at Null) Up, Down, Right, Left, Fwd, Aft Standby For MSFN GO
6	X-TRANSL - 2 JETS DEAD BAND - MIN
7	Set DAP - 01002

Basic Date Feb. 24, 1969
Changed

LM-3

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

90:46-90:52 RDZ-27

REGULATOR CHECK 10 min

1 Verify CSM Tunnel Hatch Is Closed, Tunnel Depressed

2 CABIN GAS RETURN - EGRESS
CABIN REPRESS - AUTO
PRESS REG B - EGRESS (Cabin Fans - Off And Suit Gas Diverter - Egress)

3 FWD CABIN DUMP VALVE - OPEN Then AUTO At 4.0psi (Master Alarm, CABIN Warning Lt And Auto Cabin Repress - On At 4.45 psi)

4 As Soon As Cabin Repress Starts
PRESS REG A - CLOSE (CABIN Warning Lt - Off, Cabin Repress Stops)
CABIN REPRESS - CLOSE
FWD CABIN DUMP VALVE - OPEN Then AUTO At 3.5 psi (Verify Suit Press 3.6 To 4.0 psi)

5 PRESS REG B - CLOSE (Possible Master Alarm, CABIN Warning Lt On Momentarily & Cabin Fans-On)
SUIT CIRCUIT RELIEF - OPEN Then AUTO At Suit Press of 3.5 psi
PRESS REG B - EGRESS (Suit Press 3.6 To 4.0 psi Master Alarm & CABIN Warning Lt - On Momentarily, Cabin Fans - Off)

6 PRESS REG B - CLOSE (Master Alarm, CABIN Warning Lt On Momentarily & Cabin Fans - On)
SUIT CIRCUIT RELIEF - OPEN Then AUTO At Suit Press of 3.5 psia
PRESS REG A - EGRESS (Suit Press 3.6 To 4.0 psi Master Alarm, CABIN Warning Lt - On Momentarily, Cabin Fans - Off)
CABIN REPRESS - AUTO

7 PRESS REG B - CABIN (Master Alarm, CABIN Warning Lt, Cabin Fans-On, Suit & Cabin Press Rises To 4.6 To 5.0 psi)

Basic Date — Changed — Feb. 24, 1969

LM — Changed — Feb. 25, 1969

8 PRESS REG A - CABIN
CABIN GAS RETURN - AUTO
SUIT GAS DIVERTER - PUSH/CABIN

PIPA BIAS CHECK 90:44 - 90:45 3 min

1 DET - ZERO
Request CSM Null Rates <.1°/sec
Request CSM Go CMC MODE - FREE

2 V25N21E, E, E, E/Start DET

3 V06E
06 21 XYZ PIPA PULSES (±pulses)

4 At T+32sec - ENTR
T+32sec(X)R1 + 09 (±XXXAB)
(Y)R2 + 01
(Z)R3 + 01
Notify CSM Test Complete

5 V06N01E,1452E (R1-Review X Bias)E (±AB000)
1454E (Review Y Bias)E
1456E (Review Z Bias)

6 V21 N01E
F 21 01 LOAD 1452E(Calculated X BIAS)E,E (±AB000) + 12
1454E(Calculated Y BIAS)E,E + 1
1456E(Calculated Z BIAS)E - 3
(Use Same Sign As In Measured Bias of Step 4)

AGS INITIALIZATION 3 min

1 AGS In Operate for 25 min
SET AGS TIME (BIAS 90 hr.)
UPDATE AGS
ALIGN AGS
Check 403(Hp) & 315(Ha) With V82E

Basic Date ___ Feb. 24, 1969
Changed ___

LM-3 FW-3

AGS CALIBRATION 9 min

1 Read And Record
540R X ACCEL BIAS COEFF + 0 (Octal)
541R Y ACCEL BIAS COEFF + 0 (Octal)
542R Z ACCEL BIAS COEFF -77777 (Octal)
544R X GYRO DRIFT COEFF + 7 (.01°/hr)
545R Y GYRO DRIFT COEFF + 28 (.01°/hr)
546R Z GYRO DRIFT COEFF + 0 (.01°/hr)

2 Verify AGS In Standby/Operate For 25 min, PGNS-ON, LM Thrusters Disabled, Rates <.1°/sec, RPY ICDUS Torqued Beyond 11.25° And Will Not Pass Thru 0° 45°, 90°, etc. (CSM OG=82.5°, IG=22.5°, MG=22.5° Will Give The Starting Attitude)

3 CSM Establish AGS Calibration Attitude, Minimize Rates, Go CMC MODE - FREE
V16N20E Monitor ICDU Angles (All Angles should be Approx. 22°, 67°, 112°, 157°, 202°, 247°, 292°, or 337°)
LM ICDU's: OG 112.5°
IG 202.5°
MG 022.5°
FDAI ANGLES: R 132.7°
P 339.8°
Y 301.4°

4 V40 N20E ZERO CDU

5 400 + 6E CALIBRATE GYRO & ACCEL
Read And Record After 32Sec
540R X ACCEL BIAS COEFF + 0 (Octal)
541R Y ACCEL BIAS COEFF + 0 (Octal)
542R Z ACCEL BIAS COEFF -77777 (Octal)
(If BIAS Changes >4 Counts, AGS Failed)

6 If It Apears that The Gimbal Angles Will Pass Thru 0°, 45°, 90°, 135°, 180°, 225°, 270°, or 325°, Exit Calibration By 400+0E

7 400R + 0 When GYRO & ACCEL CALIBRATE COMPLETE

Basic Date ___ Feb. 24, 1969
Changed ___

LM-3 FW-3

8 Read And Record After 5 min 2 sec

544R X GYRO DRIFT COEFF + 19 (.01°/hr)
545R Y GYRO DRIFT COEFF + 13 (.01°/hr)
546R Z GYRO DRIFT COEFF − 1 (.01°/hr)
(If GYRO DRIFT >2.50°/hr, AGS Failed)

CHANGES

Basic Date Feb. 24, 1969
Changed

LANDING RADAR SELF TEST 4 min

1 X-POINTER (Both) - HI MULT
RATE/ERR MON-LDG RDR/CMPTR
TEMP MON - LDG RDR (>49°F) (▦)
RNG/ALT MON - ALT/ALT RT
LDG ANT - DES
MODE SEL - LDG RDR
CB(11) PGNS: LDG RDR - Close
(X-POINTER Will Oscillate Then
Up And Right Off Scale)

2 RADAR TEST - LDG (Alt And Alt Rt Tapes
Drive)
TEST MONITOR-ALT XMTR(2.1 To 5.0V)(3.6V)(3.7)
-VEL XMTR(2.1 To 5.0V)(3.8V)(3.75)
ALT/ALT RT MON - +8094 To +8457 ft/-433 To
-465 fps (8280/-450) (8290/-450.5

3 LDG ANT - HOVER (10 sec)
ALT/ALT RT+7818 To +8169 ft/-441 To -457 fps
(8000/-450) (8000/-450.5

4 LDG ANT - DES (Wait 10 sec)

5 V62E INITIATE RDR SELF TEST
F 04 06 R1 00004 SPECIFY RDR
R2 00002 LDG RDR
PRO

6 F 16 66 SLANT RANGE, ANT POSITION (ft)
R1 +08165 To +08418 (08286) (8272 +1)
R2 +00001
PRO

7 F 16 67 LDG RDR VEL X, Y, Z (fps)
R1 -00230 To -00264 (-00246) (-247)
R2 +00924 To +00954 (+00930) (+930)
R3 +00643 To +00689 (+00666) (+667)

8 V34E

9 LDG ANT - AUTO

Basic Date Feb. 24, 1969
Changed

LM-3

10		V61 COMMAND ANT TO POS 2 (27 sec) ALT/ALT RT MON - +7818 To +8169ft/-441 To -457 fps (8000/-450) (8000/-450.5
11	F 04 06	V62E INITIATE RDR SELF TEST R1 00004 SPECIFY RADAR R2 00002 LDG RDR PRO 8281 +2
12	F 16 66	SLANT RNG, ANT POSITION (ft) R1 + 08156 To +08418 (08292) R2 00002 V34E TAPE 8000 -450.5
13		RADAR TEST - OFF CB(11) PGNS: LDG RDR - Open (Master Alarm - On)

RNDZ RDR SELF TEST
AND SET FOR UNDOCKING — 10 min

1		Verify CSM RCS Thruster B3 And Transponder OFF RDZ ANT - Released X-POINTERS (Both) - HI MULT RATE/ERR MON (Both - RNDZ RADAR ATTITUDE MON (Both) - PGNS MODE SEL - LDG RADAR RNG/ALT MON - RNG/RNG RATE SHFT/TRUN - +50° RDZ RDR - SLEW TEMP MONITOR - RNDZ (+10° To 150°)
2		CB(11) AC BUS A: RNDZ RDR - Close (Wait 30 sec) PGNS: RNDZ RDR - Close (NO TRACK Lt - On)
3		SLEW LEFT TO 0°, 0° SLEW RATE - LO SHFT/TRUN +5° Slew Antenna Up, Dn, Left, Right To Verify Slew

Basic Date Feb. 24, 1969
Changed Feb. 25, 1969

4		RDZ RDR - AUTO TRACK (Master Alarm & RNDZ RDR Caut Lt - On) RADAR TEST - RNDZ (Rng Rt. Tape Drives, X-Pointers And FDAI Needles Vary Between Limits. After 12sec, Rng Tape Drives, NO TRACK And RNDZ RDR Caut Lt - Out)
5		TEST/MONITOR-AGC 0.7 To 3.5v(1.5)(1.6) -XMTR PWR 2.1 To 4.8v(2.8)(3.1) -SHAFT ERR 1.5 To 3.5v(~~2.5~~ 2.2 - ~~2.8~~ 2.6)(2.2-2.6) -TRUN ERR 1.5 To 3.5v(~~2.6~~ 2.2 - ~~2.7~~ 2.4)(2.3-2.5) -AGC RDZ RDR - SLEW Slew Antenna To 0°,0° RDZ RDR - LGC (NO TRACK Lt - On)
6	F 04 06	V62E START RDR SELF TEST R1 00004 SPECIFY RADAR R2 00001 RNDZ RADAR PRO NO TRACK Lt - Out After 12 sec
7	F 16 72	RR TRUNNION AND SHAFT R1 Varying @ 1/2 cps R2 Varying @ 1/2 cps PRO
8	16 78	RANGE, RANGE RATE R1 +18900 To +19800 (+19571)(195.75) R2 -00459 To -00541 (-00495)(-496) RNG/RNG RT MON - +189 To +198 nm/-459 To -541 fps (196/-493) (195.5/-493.5)
9		V34E RADAR TEST - OFF (NO TRACK Lt-On, X-PNTR-Center)
11		V40N72E RR CDU ZERO (10 sec)

Basic Date Feb. 24, 1969
Changed —

LM-3

12 V41N72E
N73 R1+04000
R2+04000
N06 R2 00002
V16N72E (Verify FDAI Needles Up & Right
V44E (TERM DESIG)

13 V41 N72E
N73 R1-00400
R2-00400
N06 R2 00002
V16 N72E (Verify FDAI Needles)
V44E (TERM DESIG)

14 V41N72E
N73 R1+00000
R2+00000
N06 R2 00002
V16N72E (Verify FDAI Needles)
V44E (TERM DESIG)

15 V41N72E
N73 R1+00000
R2+32300
N06 R2 00002
V16N72E
CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E (TERM DESIG)

16 ADVISE CSM RR CHECK COMPLETE
CSM ACTIVATE RR XPNDR

Basic Date Feb. 24, 1969
Changed
Changed

LIGHTING CHECK 2 min

1 EXTERIOR LTG - TRACK, DOCK, OFF
Verify Operation In Each Position

Mount COAS In FWD Window And Check

3 CB(11) AC BUS B: AOT LAMP - Close
Verify Operation
CB(11) AC BUS B: AOT LAMP - Open

*PREP FOR UNDOCKING 2 min

1 Configure Cameras:
Seq Camera (CEX368 Mags (L) (T is Stowed),
5mm Lens, f11, 1/250, 6 fps)
STD Hasselblad CEX368 Mags (F) (G is Stowed),
f11, 1/250, Handle, Focus As Required)

CSM Configure For Duplex A & RCV ONLY-A
LM Configure For Basic Comm With VHF B
Backup
AUDIO (Both): VHF B - RCV
VHF B XMTR - VOICE
VHF B RCVR - ON

Basic Date Feb. 24, 1969
Changed

3 Mount Phasing Pad
DET - SET (Set for RCS Sep Time)
Overhead Hatch - Locked
OVHD DUMP VALVE - AUTO
PRESS REGS A&B - CABIN
LIGHTING: EXTERIOR - DOCK

4 ATTITUDE CONTROL (3) - PULSE
GUID CONT - AGS
MODE SEL - LDG RADAR
RNG/ALT MON - RNG/RNG RT
RATE/ERR MON (Both) - LDG RDR/CMPTR
ATTITUDE MON (Both) - AGS
SHFT/TRUN - +5°
X-POINTER - HI MULT

5 ENG ARM - OFF
X-TRANSL - 2 JETS

BAL CPL - ON
DEAD BAND - MIN
MODE CONTROL - ATT HOLD
TTCA (BOTH) - JETS
RNDZ RDR - LGC

6 Verify Undocking Attitude As:
ICDU ANGLES: OGA 120°
IGA 196°
MGA 000°
FDAI ANGLES: R 180°
P 016°
Y 300°

7 CB(11) R/D INST A - Close

CONFIGURE PGNS & AGS — 2 min

1 SET DAP V48E
N46 01011E
N47 LM WT [redacted]

2 V37E 00E
V76E
MODE CONTROL - ATT HOLD

3 V37E 30E

			1st Op	2nd Op
N33	_____	TIG	(100:26:00)	(101:55:00)
N82	_____	ΔVX(LV)	(+41590)	(+49698)
	_____	ΔVY(LV)	(-49602)	(-49538)
	_____	ΔVZ(LV)	(+00406)	(+00471)
N42	_____	HA		
	_____	HP		
	_____	ΔV		

N45 M, TFI, MGA

410 + 5E EXTERNAL ΔV
450 + _____E
451 + _____E
Z67R → 452 + _____E
411 +1E APS BURN
400 +1E GUIDANCE STEERING
500R
Verify Both ENG STOP pb - Reset

PIPA BIAS CHECK — 3 min

1 DET - Zero
Request CSM Null Rates <.1°/sec
Request CSM Go CMC MODE - FREE

V25N21E, E,E,E/Start DET

3 V06E
06 21 XYZ PIPA PULSES (±pulses)

Basic Date — Fe. 24, 1969
Changed —

At T+32 sec - ENTR
T+32 sec (X)R1 _____ (±XXXAB)
(Y)R2 _____
(Z)R3 _____
Notify CSM Test Complete

4 V06 N01E, 1452E (R1-Review X BIAS)E(±AB000)
1454E (Review Y BIAS)E
1456E (Review Z BIAS)

5 V21 N01E
F 21 01 LOAD 1452E(Calculated X BIAS) E,E (±AB000)
1454E(Calculated Y BIAS) E,E
1456E(Calculated Z BIAS) E
(Use Same Sign As In Measured Bias
Of Step 4)

PREP FOR TRANSFER 40 min

1 Stow the following in ISA:
CDR RDZ Procedures
LMP Rndz Charts & Procedures
EVA Checklist (1) ≠ G&N DICTIONARY
All Exposed And Unexposed Film (2/16mm)
Mags (L)&(T), 2/70mm Mags (F)&(G)
STD Hasselblad ~~& 5mm Lens~~
SEQ Camera & 5mm Lens
Camr Handle
Radiation Survey Meter
Passive Radiation Dosimeter
Verify Tunnel Pressurized With CSM
PRESS REGS A&B - EGRESS
OVHD CABIN DUMP VALVE - OPEN

2 Stow OPS On Floor
Stow Helmet Stowage Bags On Deck

~~Unstow PLSS, Remove LIOH Cartridge And Stow In Bag~~
~~Stow PLSS On CDR Side Wall~~

3 Open Hatch
OVHD CABIN DUMP VALVE - AUTO
Remove Drogue And Probe And Stow On
LMP Side Wall

Feb. 24, 1969
Feb. 25, 1969
Basic Date
Changed
LM-3

CDR TRANSFER TO CSM UMBILICAL 5 min

1 ~~Connect To CSM Umbilical~~
CDR SUIT ISOL - SUIT DISC
~~CSM Set LMP Suit Flow Control To Suit Flow and Audio Suit Power - Off~~
~~Connect To CSM Comm LMP (Audio,Biomed)~~
~~Notify CSM Then Conduct Comm Check~~

2 Disconnect LM Hoses And Stow
CDR Transfer To CSM with ISA & CDR RDZ Checklist

3 Docking Tunnel Index Angle ΔΦ _____

4 Unstow PLSS, Remove LIOH Cartridge, & Stow In Bag ≠ PASS TO CSM
Stow PLSS On CDR Side Wall

Feb 24, 1969
Basic Date
Changed
LM-3

LM SWITCH CLOSEOUT FOR JETTISON — 1 min

ORDEAL:
LTG - OFF

MASTER ARM - ON

CDR AUDIO:
S-BAND T/R - OFF
RELAY - OFF

GUID CONT - PGNS
THR CONT - AUTO
MAN THROT - CDR
ENG ARM - OFF
ASC He REG 1&2 tb-gray
ABORT And ABORT STAGE - Flush/Guarded

SYS A&B ASC FUEL & ASC OXID (4)-tb-bp
SYS A&B QUAD 1,2,3,4 (8) - tb-gray
CRSFD - tb-bp
SYS A&B MAIN SOV - tb-gray
ATTITUDE MON - AGS (LMP)
GLYCOL - PUMP 1
O2/H2O QTY MON - C/W RESET

ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL - ATT HOLD
RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO
EXTERIOR LTG - ~~TRACK~~ OFF

Basic Date — Feb 24, 1969
Changed — 6

LM-10

7 ACA/4 JET (2) - ENABLE
TTCA/TRANSL (2) - ENABLE

8 INVERTER - 2
~~BAT 5&6 NORMAL FEED (2) - tb-bp~~
BAT 5&6 BACKUP FEED (2) - ~~tb-gray~~ ON tb-gray
BAT 5&6 NORMAL FEED (2) - OFF/RESET tb-bp

AUDIO (LMP)

9 S-BAND T/R - OFF
RELAY - OFF

10 S-BAND - PM,PRIM,PRIM,OFF,PCM,
RANGE,OFF,HI
TAPE - OFF tb-bp
S-BAND - FWD ~~OR AFT~~

11 SUIT GAS DIVERTER - PULL/EGRESS
CABIN REPRESS - CLOSE
PLSS FILL - CLOSE
DES O2 - CLOSE
ASC 1 O2 - CLOSE
ASC 2 O2 - OPEN
SUIT ISOL (CDR) - SUIT DISC
SUIT CIRCUIT RELIEF - AUTO
CABIN GAS RETURN - EGRESS

12 CABIN RELIEF AND DUMP (2) - AUTO

13 DFI PRIMARY - ON, SECONDARY - OFF

LMP TRANSFER TO CSM UMBILICALS 4 min

1 Connect To CSM Umbilical
LMP SUIT ISOL - SUIT DISC
Request CSM Set LMP Suit Flow Control
To Suit Full Flow And Audio Power - Off

2 Connect To CSM Comm CDR (Audio,Biomed)
Notify CMP Then Conduct Comm Check
VHF - OFF,OFF,OFF,OFF
Disconnect LM Hoses And Stow
PRESS REG A&B - EGRESS

Basic Date Feb. 24, 1969
Changed

LM-3

3 Remove Tape Recorder & Pass To CSM
Receive And Stow ISA On Floor

4 V37E00E
UPDATE AGS
ALIGN AGS
100+1E
267R VERIFY TOTAL ATT

5 V37E 42E
F 50 18 ENTR
F 50 19 CSM MNVRS
Verify Attitude
V37E00E
Verify CSM Min Deadband
MODE CONTROL - AUTO
SYS A&B ASC FEED 2(2) - OPEN tb(4)-gray
SYS A&B MAIN SOV - CLOSE tb-bp

FINAL CABIN CLOSEOUT

INVERTER - OFF

2 CB(11)
Row 1: All Open
Row 2: All Open Except:
RCS SYS A: QUAD 4,3,2,1 TCA(4) - Close
Row 3: All Open Except:
INST: SIG CONDR 1 - Close
STAB/CONT: ATCA (PGNS) - Close
AELD - Close
ENG CONT - Close
Row 4: All Open Except:
HEATERS: RCS SYS A/B-1:
QUAD 4,3,2,1(4) - Close
ECS: GLYCOL PUMP 2&1 - Close
GLYCOL PUMP AUTO TRNFR - Close
COMM: UP DATA LINK - Close
PGNS: LGC/DSKY - Close
IMU STBY - Close
IMU OPR - Close
Row 5: All Open Except:
EPS: BAT FEED TIE (2) - Close
XLUNAR BUS TIE - Close
ASC ECA - Close

Basic Date Feb. 24, 1969
Changed

LM-3

DC BUS VOLT - Close
R/D INST A - Close
DFI PWR - ON
R/D INST B - Close

3 CB(16)

Row 1: All Open Except:
RCS SYS B:
QUAD 1,2,3,4 TCA (4) - Close
TEMP/PRESS DISP-FLAGS - Close
POGS DISP - Close

Row 2: All Open Except:
LTG: FLOOD - Close
TRACK - Close
MASTER ALARM - Close
STAB/CONT: AEA - Close
ENG ARM - Close
ASA - Close
AELD - Close
ATCA - Close
INST: CWEA - Cycle Open Then Close
SIG SENSOR - Close
PCM/TE - Close
SIG CONDR 2 - Close

Row 3: All Open Except:
COMM: PRIM S-BD PWR AMPL - Close
PRIM: S-BD XMTR/RCVR - Close
PMP - Close

Row 4: All Open Except:
HEATERS: RCS SYS A/B-2
QUAD 1,2,3,4 (4) - Close
EPS: DISP - Close
DC BUS VOLT - Close
ASC ECA - Close
XLUNAR BUS TIE - Close
BAT FEED TIE (2) - Close

4 Ingress CSM And Secure Hatch

Basic Date Feb. 24, 1969
Changed

FIRE/SMOKE IN CABIN (Not In Suit Loop)

1

PRESS REG A&B - EGRESS
SUIT GAS DIVERTER - EGRESS
Check POWER/TEMP MON For Excessive Current, Remove Power From Affected Bus
Use Fire Extinguisher As Required
Don Helmets And Gloves
SUIT FAN - Redundant Fan
Combustion Products Should Be
*Considered Toxic. Smoke And *
*Contaminants Must Be Removed *
*From Cabin Before Removing *
Helmets By Purging or Dumping
*Cabin. *

2

If Fire Persists
Prepare To Dump Cabin (If Ascent Stage Only, Insufficient O2 Available For Repress)
Visually Perform Suit Integrity Check
CABIN GAS RETURN - EGRESS
CABIN DUMP (Fwd) - Open, Then Auto At 3.2 psia (Verify Suit Press - 3.6-4.3 psi)
Cabin Dump Valve Open, Until Cabin Press 0 psi

3

When Fire Goes Out
SUIT GAS DIVERTER - PULL/EGRESS
SUIT CIRCUIT RELIEF - AUTO
CABIN GAS RETURN - EGRESS
CO2 Canister - MID Position
PRESS REG B - EGRESS
PRESS REG A - DIRECT O2 (Until ARS Clear; Suit Press Will Increase To About 5.8 psia)
CO2 Canister Sel - PRIM

Basic Date Feb. 24, 1969
Changed Feb. 25, 1969

FIRE/SMOKE IN SUIT LOOP (MAY BE IN CABIN ALSO)

1 SUIT ISOL (Both) - SUIT DISC
SUIT FAN - OFF
PRESS REG A&B - CLOSE
Combustion Products Should Be Con-
*sidered Toxic. Smoke And Contam- *
*inants Must Be Removed From Cabin *
Before Removing Helmets By Purging
*or Dumping Cabin *
Remove Helmet & Gloves
SUIT CIRCUIT RELIEF - CLOSED
CABIN GAS RETURN - EGRESS
SUIT GAS DIVERTER - PULL/EGRESS

2 Isolate SUIT LOOP Electrically
CB(11)ECS: SUIT FAN 1 - Open
CB(16)ECS: SUIT FLOW CONT - Open
SUIT FAN 2 - Open
SUIT FAN ΔP - Open
DIVERT VLV - Open
CO2 SENSOR - Open
CABIN REPRESS - MANUAL As Necessary
To Maintain Cabin Pressure And
Replenish O2

3 When Fire Goes Out
If Cabin Contaminated - Purge As Necessary
CABIN REPRESS - MANUAL
CABIN DUMP VALVE - AUTO
If Ascent Stage Only, Closely Monitor
O2 Supply

Basic Date
Changed

WARNING LIGHTS LM-3

AGS
1. AEA Test Mode Discrete Signals Fail Condition
2. ASA Heater Fails On Causing A Temp Sensor To Open The +12 vdc Supply
3. Power Supplies Out Of Limits

1. Switch To PGNCS Control
2. Perform AGS Self Test 412R (+1 Test Passed)

ASC PRESS
1. He TANK < 2775 psia (Inhibited after Staging)
2. FUEL, OXID TANK < 120 psia

1. Cross-Check PRPLNT TEMP/PRESS MON - ASC
2. Shut Down APS When Press < 120 psi
3. Close ASCENT He REGS 1&2 And Check For Leak

CABIN
1. Cabin Pressure < 3.7-4.45 psia (Light Disabled In Egress Position)

Basic Date
Changed

1. Cross-Check Cabin Press, Suit Press, & Cuff Gages
2. Close CABIN DUMP VLVS, Check PRESS REGS A&B - CABIN, CABIN REPRESS - AUTO
3. Don Helmet & Gloves, Then Turn CABIN REPRESS - CLOSE And PRESS REGS A&B - EGRESS, CABIN GAS RETURN - EGRESS, SUIT GAS DIVERT - PULL/EGRESS To Troubleshoot

CES AC
1. CES AC Pwr Supplies Out Of Tolerance

1. GUID CONT - PGNCS
(No Rate Damping Or Attitude Control Or No Manual SPS Throttling In AGS)

CES DC 1. CES DC Pwr Supplies Out Of Tolerance

1. GUID CONT - PGNCS
(No DPS Throttling In PGNS Or AGS, AGS Direct Still Available, DPS May Go To 100%, Deadband Inoperative)

DC BUS 1. Either Or Both DC Buses < 26.5 V

1. Check For BATTERY CAUTION LT, BATT Or DC BUS Component Lights, Check All BAT & BUS Voltages, And Reset All BAT tb's.
2. If No Other Lights - Separate Buses By Opening CROSS TIE BAL LOADS cb And Observing PWR/TEMP MON. If Volts And Amps Not Normal Power Down Low Bus, Open All cb's, Check For Bus Or Feeder Short By Observing DC BUS FAULT LT (If SE BUS) And PWR/TEMP MON (If CDR's BUS)

3a. If DC BUS FAULT LT ON (And Unstaged) Indicates ECI Or DFR OPEN - Use BAT 6 NORMAL CDR FEED-ON.

3b. If DC BUS FAULT LT ON (And Staged) Power Down Bus, Open All cb's (Except BAT FEED TIE(2) And DC BUS VOLT). If DC BUS FAULT LT Still On Indicates BAT 6 Lost, Reconfigure With BAT 5 Backup Feed. If DC BUS FAULT LT OUT - Indicates Failed ECA.

4. If BATTERY CAUTION LT And DC BUS LT ON - CDR Bus Power Lost - Check BAT tb - If Only One BAT bp (Unstaged Only) Remove Other BAT And Reset The bp BAT. If Both BATS bp (Or 1 Bat bp Staged) Check For Bus Or Feeder Short By Opening All cb's (Except DC BUS Volts) And Observing DC BUS FAULT LT - If LT OFF, CDR BUS FEED SHORT.

5. (For LMP BUS POWER FAILURE, C/W PWR CAUTION LT WILL BE ON) And Flood And Integral Lights Will Be Off - See Procedures Under C/W PWR Procedures

Basic Date
Changed

DES QTY 1. Burn Time < 2 Min @ 25%
2. FUEL Or OXID < 6%
(Only ARMED When DPS's ON)

1. Cross-Check PROP QTY
2. Shutdown DPS Before Depletion

DES REG 1. He Downstream Of REGS < 220 Or > 260psi

1. Close REG 1 & Open REG 2
2. If Press Decay Continues Below 140 psi Shutdown DPS
3. Close REG 2

ISS 1. IMU Fails, ICDU Fails, Or PIPA Fails During Thrust

1. Switch To AGS Control
2. Perform MANUAL Engine Shutdown

LGC 1. LGC Prime Pwr, Scalar, Or Counter Fails

1. Switch To AGS Guidance
2. Perform MANUAL Engine Shutdown

RCS A REG 1. He REG PRESSURE < 165 Or > 205 psi

1. Cross-Check PRPLNT FUEL MANF And OXID MANF Pressures
2. If Press Below 140 Or Above 205 psi, Turn Off SYS A MAIN SOV And Use CROSSFEED

RCS B REG 1. He REG PRESSURE < 165 Or > 205 psi

1. Cross-Check PRPLNT FUEL MANF And OXID MANF Pressures
2. If Press Below 140 Or Above 205 psi, Turn Off SYS B MAIN SOV And Use CROSSFEED

Basic Date
Changed

RCS TCA
1. One Or More Thrusters Fail Off
2. Colinear Thrusters Fire Simultaneously
3. Detects Thruster Failed On If Rate Feedback In Effect

1. If Only One Red Flag, Close QUAD VALVE
   If More Than One Red Flag In Same SYS, Open MAIN SOV or ASC FEED In Affected SYS A or B
2. Complete Translation If Translating
3. If Thruster Firing Continuously, Turn Off QUAD VALVE With Red Flag (This Would Fix Stuck-On Thruster)
4. If Not Continuously Firing Recycle All RCS VALVES To Normal Position - Use TCA cb's And Rate Command Attitude Control To Troubleshoot

SUIT/FAN
1. Suit Pressure < 3.12 psi
2. Suit Fan #2 Fails While It Is Selected

Cabin Depressurized

1a. Cross-Check With SUIT And CABIN PRESS, And With PGA CUFF GAGE
1b. Check PRESS REG A&B - EGRESS. If Press Still Too Low Set PRESS REG A&B - DIRECT O2 Intermittently To Hold Suit Press Up Until Cabin Can Be Repressurized
1c. If Suit Isol Valves Closed And Suit Integrity OK, Pull CB(16) ECS: Suit Flow Cont - Open & Suit ISOL VLVS To Suit FLOW

Cabin Pressurized

2a. Cross-Check SUIT And CABIN PRESS And CUFF GAGE
2b. Check Suit Flow If SUIT FAN 2 Selected
2c. If Suit Isol Valves Closed - Pull CB(16) ECS: Suit FLOW Cont - Open & Suit ISOL vlvs To Suit FLOW

Basic Date
Changed

CAUTION LIGHTS LM-3

ASC HI REG
1. He Manifold Press > 220 psi

Continue Engine Burn And Close Both ASC He REG 1 & 2
2. Cross Check ASC PRESS
3. When He Press Drops Below 220, Open REG 1 - If Light Comes On Again Close REG 1 And Open REG 2

ASC QTY
1. When About 10 Sec Of Propellant Burn Time Remains

1. Stop ASC Fuel And ASC Oxid Feed To RCS
2. Cross-Check With ASC He Pressure
3. Shutdown ASC Engine

BATTERY
1. Bat Reverse Current > 10 Amp For 4-6 Sec
2. Bat Temp > 145°F
3. (Bat Overcurrent Trip Will Result In Additional Loss)

1. Check All Bat tb's. If bp, Try Resetting Bat OFF/RESET Then On
2. Check All Bat Positions And Note On Which Bat The Bat Fault Component Lt Illuminates
3. Remove Faulty Bat From Bus

C/W PWR
1. No C/W Warning Pwr
2. Illuminates With Loss Of Entire LMP Bus

a. No Other C/W Lights (C/W Failure) - RESET CWEA cb
a. DC Bus Fault Lt - ON, Flood And Integral Lighting Off (LMP Bus Failure)
2b. LMP AUDIO CONT - BU, Pwr Up INV 2, And Open All cb's On LMP Panel (16)
2c. If DC Bus Fault Lt Goes Off, Bat To Bus Feeder Open. Set BAT 5 NORMAL SE FEED-ON, Close All cb(16)

Basic Date
Changed

2d. If DC Bus Fault Lt Stays On, Take Each Bat Off Line In Sequence And Monitor The DC Bus Fault Lt. When Lt Goes Out It Signifies Faulty Bat Removed. Reconfigure With ASCENT BAT 5 And/Or CROSS TIE BUS cb's.

2e. If DC Bus Fault Lt Stays On With Both Bats Removed, Open Both BAT FEED TIE cb's. If DC Bus Fault Lt Goes Out It Indicates A Feeder Short. Reconfigure With Bat 5. If Lt On Indicates LMP Bus Short.

ECS

1. Suit FanΔP < 6" H20
2. CO2 Partial Pressure > 7.6 mm Hg
3. H20 Sep Speed < 800 rpm
4. Glycol PumpΔP < 3 psid

1. Cross-Check Component Lights And Select Redundant Component
2. If No Component Lights On, CWEA Failure

ED RELAYS

1. Light Illuminates If Contacts Of Master Arm Relay or Staging Sequence Relays Fail Closed (Both Stage System Lights Should Be On When Master Arm - On, And Off When Master Arm - Off)

1. Do Not Turn On Master Arm Switch
2. Attempt To Reset Stage Relay - If Unable Pull Appropriate ED Logic Pwr

GDA/RCCA

1. Light On If There Is Discrepancy Between Gimbal Drive Signal And Gimbal Response During DPS Burn

1. Monitor RCS Duty Cycle And Attitude Rates. If Increasing, Set ENG GIMBAL - OFF
2. If RCS Duty Cycle Still Excessive, Shutdown The DPS

Basic Date Changed

GLYCOL

1. Glycol Temp > 50°F
2. Glycol Remaining In Accumulator < 10%

Cross-Check Glycol Temp And Press, CABIN And SUIT TEMPS, And H20 QTY

2a. If Glycol Temp > 50°F Observe Rate Of Glycol Temp Increase. If Temp Steady Suspect Thermal Overload Or INST/CWEA Failure

2b. If Increasing, Recycle PRIM EVAP FLOW - OPEN

2c. If Glycol Temp Continues To Increase, Close PRIM EVAP FLOW And Set PRIM EVAP FLOW #2 OPEN

2d. If Glycol Temp Continues To Increase, Activate Secondary Loop By WATER TANK SEL-SEC, GLYCOL INST(SEC), cb GLYCOL PUMP SEC - Close, SEC EVAP FLOW OPEN Then Shut Down Primary Loop

3. If Glycol Temp < 50°F Suspect Low Glycol Quantity, Monitor Glycol Temp, Press Gages

HEATER

1. RR - Temp < -54°F or > 148°F
2. LR Heater (C&W Not Operable In LM-3)
3. RCS- Temp < 119°F or > 190°F
4. S-Bd-Temp < -64°F or > 153°F

1a. RR Too Hot - Check For Heat Soak, Open Both RNDZ HTR cb's (If Still Too Hot Open CB AC BUS A: RNDZ RDR, Then CB PGNS: RNDZ RDR When RR Not Needed)

1b. If Too Cold - Power Up RNDZ RDR

2a. LR Too Hot - Open LDG RDR HTR CB & CB PGNS: LDG RDR When LR Not Needed (Note: When CB PGNS Is Closed, Relay Open Line Between CB HTR: LDR RDR & LR Heaters)

2b. LR Too Cold - Power Up LDG RDR

3a. RCS Too Hot - QUAD A/B-1 & 2 - Open

3b. RCS Too Cold - QUAD A/B-1(or 2) - Closed, RCS SYSTEMS A/B-2 Sw - MANUAL

4a. S-BD Too Cold - CB COMM: S-BD ANT - Close

4b. S-BD Too Hot - CB COMM: S-BD ANT - Open & CB HTR: S-BD-Open (When S-BD not Needed)

Basic Date Changed

INVERTER
1. AC Voltage < 112 Volts
2. Frequency < 398 cps > 402 cps

1. Check All AC Bus A/B: BUS TIE INV 1&2 cb's (4)
2. If Some cb's Open Determine If INV 1 Feeder Short Or AC Bus A Or Bus B Short By Pulling BUS TIE INV 1 cb's And Closing Bus Tie INV 2 cb Then Monitor cb's

3a. If All cb's Remain Closed Cross-Check With Pwr/Temp Mon

3b. If Volts In Green - Determine If INV 2 Or CWEA Failure By Powering Up INV 1

3c. If Volts Not In Green - Determine If INV 2 Or INV 2 Feeder Short By Powering Up INV 1 - If Any AC BUS A/B: BUS TIE INV cb2 Open; Indicates INV 2 Feeder Short

4. If All cb's Do Not Remain Closed - Check For AC Bus Short Or INV 1 Feeder Short By Opening Both AC BUS A/B BUS TIE INV 1 cb's And Closing Both AC BUS A/B BUS TIE INV 2 cb's.

LDG RDR — If Light Comes On It Is A Failure Of The LR Data Good Circuit Or CWEA

O2 QTY
1. Descent Qty < 5%
2. Either Ascent O2 Tank Qty < 80% Prior To Staging
3. Ascent O2 Tank #1 Qty < 10% When Staged

1. Cross-Check O2 Qty Gage and Cabin Press
2a. If Cabin Press Normal and O2 Leak Outside Cabin Or Cabin Leak. Close Dump Vlvs And Put Cabin Repress - Close And PRESS REGS A&B - EGRESS
2b. If Cabin Press High - Check PRESS REGS A&B, CABIN REPRESS, PLSS VLVS For Possible Failures
3. If Descent O2 Lost, Go To ASC 1 And Close CABIN REPRESS, SUIT GAS DIVERTER - PULL/EGRESS And CABIN GAS RETURN - EGRESS

Basic Date — Changed —

PRE AMPS 1. Lt On If Either RCS Bias Pwr Supply To The Prim Preamped & Jet Drivers Out Of Limit (One From cb ATCA And One From cb ATCA [PGNS])

1. If Both Bias Voltages Out Of Tolerance There May Be Sporadic RCS Firings

RCS 1. He Tank Press <1700 psia

1. Cross-Check RCS He PRESS,[PRPLNT, And FUEL MANF And OXID MANF PRES](The Bracketed Positions Are Useful Only If There Has Been a Propellant Leak Followed By a Bladder Rupture). Cross-Check RCS Qty (Qty Gage Uses He Press)
2. Use Both SYS When FUEL or OXID MANF press 140 psia, Close Bad Systems MAIN SOV
For RCS Burns, Use ASC FEED Or CROSSFEED From Good RCS (RCS Fuel And Oxid In Failed System Unusable)

RNDZ RDR 1. When RR Is In Auto Track Mode And Loses CSM Lock-On (NO TRACK LT Should Be On Also)

1. Determine If RR Is Tracking CSM
2. Check For Momentary Data Loss By Selecting MODE CONT - SLEW Then AUTO TRACK
3. Check AGC And XMTR PWR. If Low, Cycle cb PGNS-RNDZ RDR To Eliminate Chrona
4. Attempt Reacquisition With P20 or Visually With AUTO TRACK Or With AGS 400 + 2 And AUTO TRACK Check CSM Transponder

WATER QTY
1. Descent H2O Qty < 16%
2. Either Ascnet H2O Tank Qty < 95% Unstaged
3. H2O In Ascent Tank #1 And #2 Differ By >15%

Basic Date — Changed —

1. Cross-Check With H2O Gage
2. Verify H2O TANK SELECT In Proper Position
3. Verify SEC EVAP FLOW And PRI EVAP FLOW #2 - CLOSED
4. Monitor Glycol Temp And When > 50° Select ASC H2O Tank

COMPONENT CAUTION LIGHTS

DC Bus Fault

Illuminates When Voltages Between Buses Differ; Fully Bright When Voltages Differ By > 18 Volts. When All cb's Are Opened On A Suspect BUS, Then BUS CROSS - TIED To the Other Bus. Light On Will Indicate A Bus That Exists.

Battery Fault

Illuminates When That Specific Battery Temp > 145°F, Reverse Current > 10 Amps For 4-6 Sec, Overcurrent Has Disconnect Bat > 150-200 Amp.

Range/Range Rate Power Failure Light

Loss Of:
1. Range
2. Range Rate
3. PCM/TE
4. AC Power To Meter

Suit Isolation Valves

Closes At 3.11 psia. Cabin Repress Will Be Activated At The Same Time. (If Enabled)

Cabin Repress

Will Activate At 3.70-4.45 And Close At 4.40-5.0.

UPDATE PADS, PHOTO LOGS, CREW COMMENTS

LM P27 UPDATE

V	V	V	PURP
INDEX	INDEX	INDEX	01 306
			02 307
			03 310
			04 311
			05 312
			06 313
			07 314
			10 315
			11 316
			12 317
			13 320
			14 321
			15 322
			16 323
			17 324
			20 325
			21 326
			22 327
			23 330
			24 331
+	+	+	T φ(+N) λ(+E) H NAV CHECK

REMARKS

Changed

P27 UPDATE

LM P27 UPDATE

V	V	V	PURP
INDEX	INDEX	INDEX	01 306
			02 307
			03 310
			04 311
			05 312
			06 313
			07 314
			10 315
			11 316
			12 317
			13 320
			14 321
			15 322
			16 323
			17 324
			20 325
			21 326
			22 327
			23 330
			24 331
+	+	+	T ϕ(+N) λ(+E) H

NAV CHECK

REMARKS

P27 UPDATE

LM P27 UPDATE

V	V	V	PURP
INDEX	INDEX	INDEX	01 306
			02 307
			03 310
			04 311
			05 312
			06 313
			07 314
			10 315
			11 316
			12 317
			13 320
			14 321
			15 322
			16 323
			17 324
			20 325
			21 326
			22 327
			23 330
			24 331
+	+	+	T ϕ(+N) λ(+E) H

NAV CHECK

REMARKS

P27 UPDATE

LM P27 UPDATE

V	V	V		PURP
INDEX	INDEX	INDEX		01 306
				02 307
				03 310
				04 311
				05 312
				06 313
				07 314
				10 315
				11 316
				12 317
				13 320
				14 321
				15 322
				16 323
				17 324
				20 325
				21 326
				22 327
				23 330
				24 331
: :	: :	: :		T
				ϕ(+N)
				λ(+E) NAV
+ .	+ .	+ .		H CHECK

REMARKS

P27 UPDATE

FLIGHT PLAN UPDATE

TIME	ITEM

F.P. UPDATE

FLIGHT PLAN UPDATE

TIME	ITEM

3
4
8
9
10
11
12
13
14
15
F.P. UPDATE

FLIGHT PLAN UPDATE

TIME	ITEM

F.P. UPDATE

PHOTO LOG

16mm (CEX368,EF)

START GET	MAG	Ft	REMARKS (f,t,LENS,FPS)

16mm LOG

TIME	REMARKS

LOG

TIME	REMARKS

3
4
8
9
10
1
12
13
14
15

LOG

TIME	REMARKS

LOG

TIME	REMARKS

LOG

TIME	REMARKS

PALLET DIDN'T LOCK ON STOWAGE BRACKET.
(HAVE JIM DESCRIBE)
ARS PGA INTEGRITY CHECK – LMP NOT ON SUIT LOOP
DOC TO BLOCKED EAR (RIGHT)
PGNS TURN ON: LGC NOT IN STANDBY ALTHOUGH LEFT
THERE ON SYS DAY
AGS ACTIVATION & SELF TEST: AGS WARNING LT
CAME ON FROM OFF TO STANDBY & STAYED
ON. ALSO OP ERR CAME ON MANY TIMES WITH CLR.
RATE GYRO CK – OK EXCEPT FOR BIAS & HYSTERESIS IN
NEEDLES.
DOCKED IMU ALIGNMENT: OK
APS PRESS – SMALL POP – NOT MUCH – NICE SMOOTH
BUILD UP TO 190
RCS HOT FIRE – ALL 8 RED T.B.'S ON BY THIS
TIME.
REG CHECK – WORKED AS ADVERTISED – USED SUIT/GAS
DIVERTER IN LIEU OF SUIT CIR REL FOR
DROPING SUIT TO 3.5.

LOG

TIME	REMARKS
	ENTRY STATUS CHECK:
	N.C. - PWR SWITCHOVER AS IN
	THE BOOK - CW PWR CAUTION LIGHT
	INDICATES SWITCHOVER WITH MOMENTARY
	DROP IN LIGHTING; DES O2 & PRESS REGS A & B LEFT IN WRONG POSITION.
VHF ACTIVATION:	NO DIFFERENCE IN COMM
	WITH ANY ANTENNA COMBINATION
	EXCEPT THAT IN RNDZ CONFIG COMM
	SEEMED TO DEGRADE SLIGHTLY
GLYCOL PUMP ACTIVATION:	NO PROB - SOUNDED LIKE JUST
	A LITTLE GAS IN SYSTEM AT START.
C&W CHECKOUT -	ALL LIGHTS EXACTLY AS IN
	CHECKLIST! I OWE YOU A SPAGETTI
	DINNER AT ALMA'S
CB ACTIVATION:	GLYCOL TEMP USUALLY GOT >60°
	PRIOR TO FINISHING ACTIVATION :. HAD TO
	CLOSE CB(16) PRI GLY EVAP FLOW & OPEN H_2O.
TB VERIFICATION:	~~HAD~~ STICKY SYS A AGC FEED HZ
	J.B. HUNG UP ON GRAY → ALSO CHARACTERISTIC
	OF T.B. TO GO GRAY WHILE HOLDING
	SWITCH.
SUIT FLOW &	H_2O SEP CHECK - H_2O SEP COMP LT TAKES
	A LONG TIME TO COME ON (TOO LONG TO WAIT)
	& WHEN SWITCHING TO OTHER SEP IT EVIDENTLY WAS
	ALREADY UP TO SPEED SINCE LIGHT DIDN'T COME
	ON.
S-BD & VHF ACTIVATION:	- ON RNDZ DAY THE LMP UNITS
	PTT & ACA PTT WERE INOP. VOX OK.
OPS CK.	CDR OPS HTR CK DIDN'T LIGHT LIGHT
	ALTHOUGH ON EVA DAY IT WORKED 1 OUT OF 5